PARTS LIST & CIRCUIT DIAGRAMS

FISHER

FVH-P1200KV

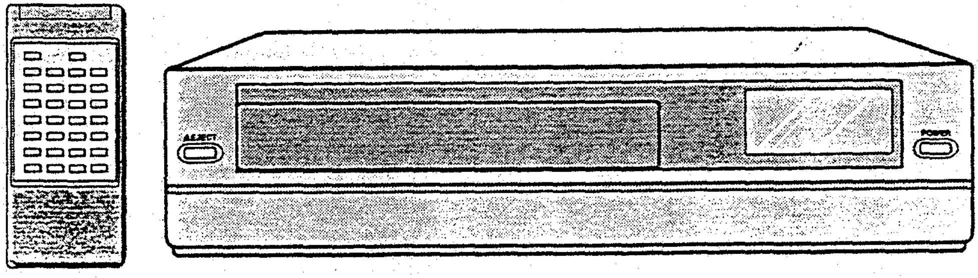
Video Cassette Recorder

VHS PAL HQ

A50

Please see other materials with Reference No. given in table below.

Materials	Model No.	Reference No.
SERVICE MANUAL	FVH-P1200 Series	WM-530864
MECHANISM MANUAL	P90 MECHANISM	WM-530598
	P91 MECHANISM	WM-530830



CONTENTS

ACCESSORIES 1
PACKING MATERIALS 1
CABINET & CHASSIS PARTS 1
MECHANISM PARTS 1 2
MECHANISM PARTS 2 3
MECHANISM PARTS 3 4

ELECTRICAL PARTS
  COMPL PCB, CP-A 5
  COMPL PCB, VD-1 9
  COMPL PCB, VP-1 9
  COMPL PCB, CP-2 10
  COMPL PCB, PW-1 11
  COMPL PCB, PW-2 12
  COMPL PCB, PW-3 12
  IF PACK 12
  COMPL PCB, TN-7 12
  COMPL PCB, TM-1 13
  COMPL PCB, TM-2 14
  COMPL PCB, TM-8 14
  COMPL PCB, TB-1 14
REMOCON 15
  COMPL, RM-1 15
CIRCUIT DIAGRAM

PRODUCT SAFETY NOTICE

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage and voltage ratings shown.

NOTE: 1. Parts order must contain Model Number, Part Number and Description.
2. N.S.P.: Not available as service parts.

SP1/G-F2 143 131 29

REFERENCE No. WM-530865

ACCESSORIES

LOCATION	PARTS NO.	DESCRIPTION
	613 124 3156	REMOCON
	613 125 6569	INSTRUCTION MANUAL
	613 124 3668	CAUTION SHEET
	613 096 6773	CABLE,ANT
OR	613 011 7359	CABLE,ANT
	613 095 0550	CORD,POWER

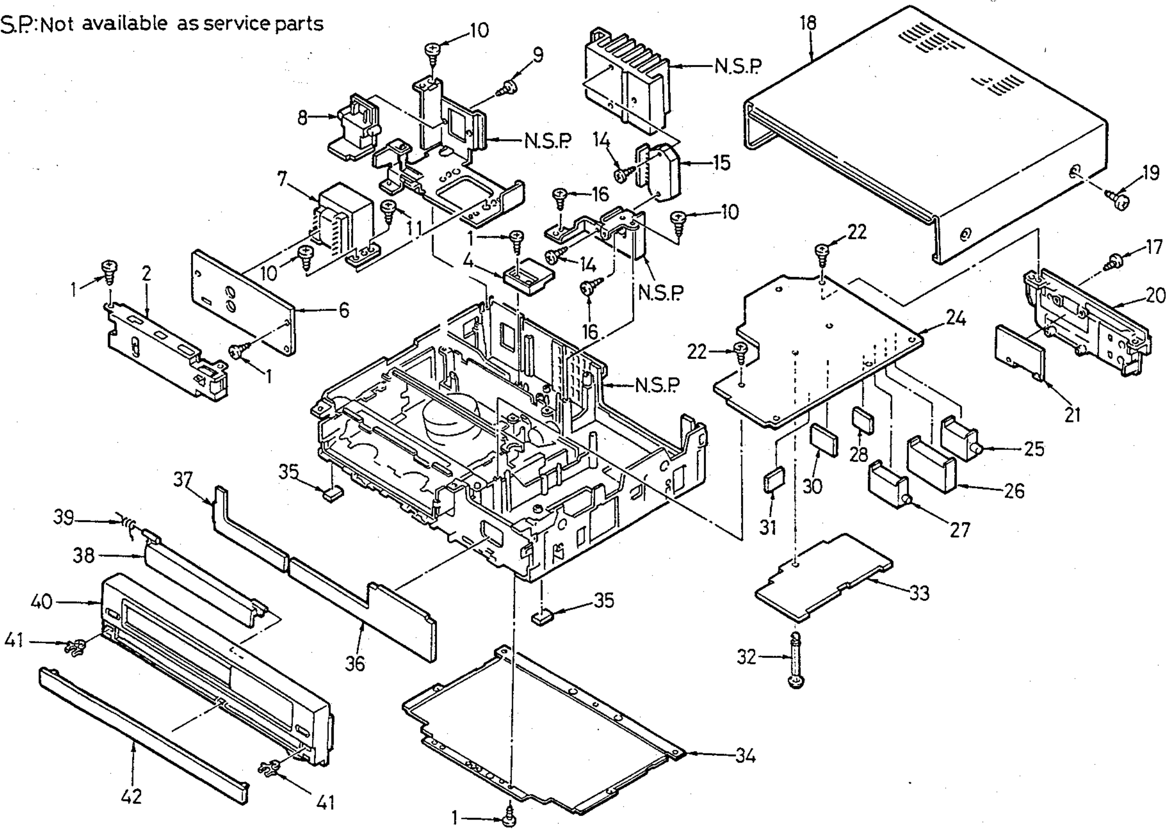
PACKING MATERIALS

LOCATION	PARTS NO.	DESCRIPTION
	613 125 7474	CORR CASE,INNER
	613 125 5708	CUSHION,INNER RIGHT
	613 125 5692	CUSHION,INNER LEFT
	613 099 1768	POLYE COVER,INNER
	613 107 8970	BAR CODE LABEL

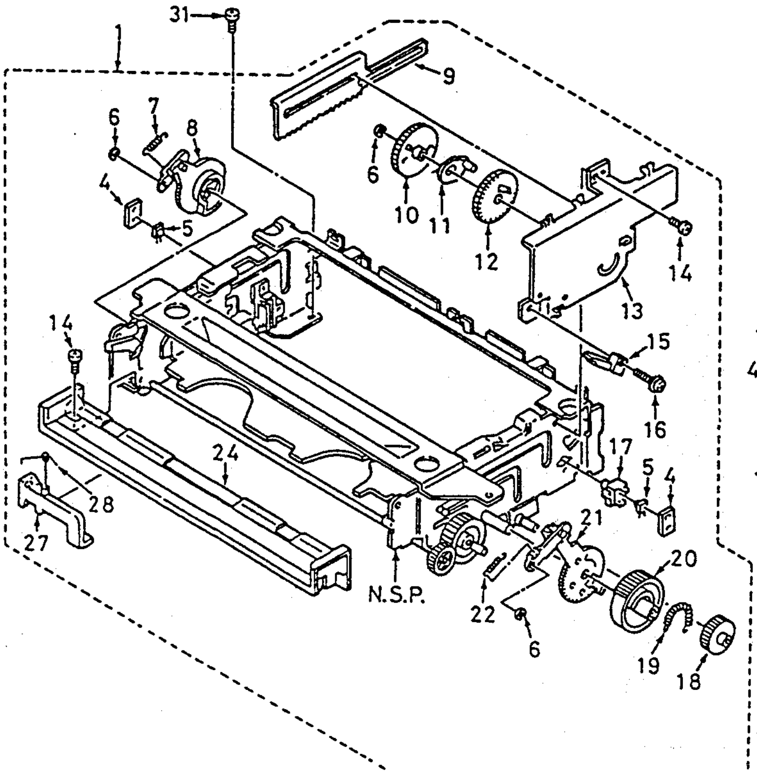
CABINET & CHASSIS PARTS

LOCATION	PARTS NO.	DESCRIPTION
1	411 137 0007	SCR L-TPG BIN 3X10
2	613 120 6212	COMPL PCB,VP-1
4	613 128 1578	HOLDER
6	613 123 5274	COMPL PCB,PW-1
7	613 120 8391	TRANS,POWER,T5001
8	613 120 6199	COMPL PCB,PW-3
9	411 021 6603	SCR S-TPG BIN 3X8
10	411 021 7907	SCR S-TPG BIN 4X12
11	411 021 9604	SCR S-TPG BIN 4X8
14	411 021 4500	SCR S-TPG BIN 3X16
15	613 120 6182	COMPL PCB,PW-2
16	411 021 6405	SCR S-TPG BIN 3X8
17	411 021 3701	SCR S-TPG BIN 3X10
18	613 124 8939	COVER,TOP
19	412 028 9406	SPECIAL SCREW
20	613 121 3814	TERMINAL
21	613 125 3902	COMPL PCB,TB-1
22	411 021 3800	SCR S-TPG BIN 3X10
24	613 125 6613	COMPL PCB,CP-A
25	613 080 5836	MODULATOR,RF
OR	613 120 5659	MODULATOR,RF
26	613 107 0547	IF PACK
27	613 113 7974	TUNER PACK
28	613 127 8028	COMPL PCB,TN-7
30	613 120 6076	COMPL PCB,VD-1
31	613 108 5534	COMPL,TM-8
32	613 126 5103	HOLDER(INCLUDE CP-2)
33	613 124 8649	COMPL PCB,CP-2
34	613 121 0967	COVER,BOTTOM
35	613 121 1001	STAND,FELT
36	613 123 2334	COMPL PCB,TM-1
37	613 123 2358	COMPL PCB,TM-2
38	613 125 7177	DOOR,CASSETTE
39	613 110 2927	SPRING,DOOR CASSETTE
40	613 123 3577	ASSY,CABINET,FRONT
41	613 048 2884	LOCK
42	613 125 7191	DOOR,FRONT

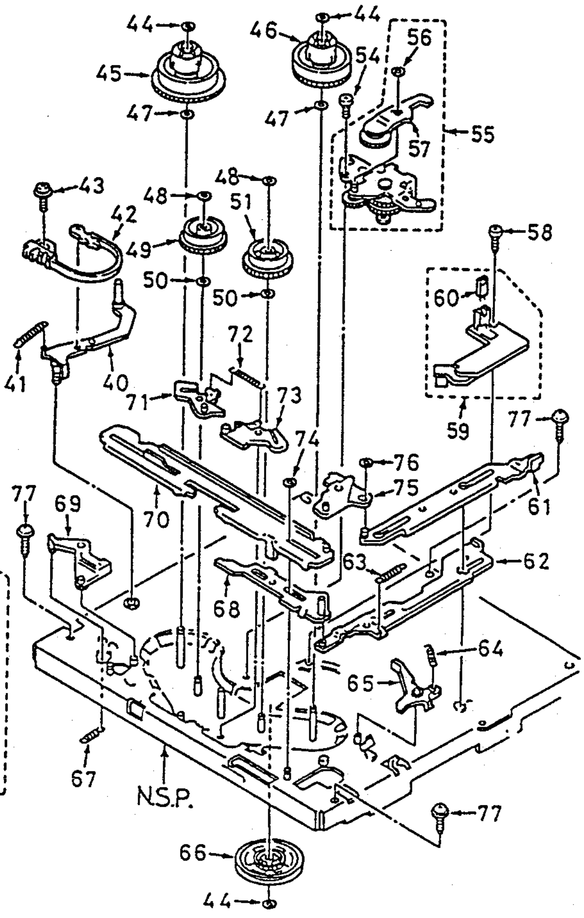
N.S.P:Not available as service parts



LOCATION	PARTS NO.	DESCRIPTION
MECHANISM PARTS 1		
1	613 125 4855	COMPL.CASSETTE MECHA
4	613 022 0585	LID
5	407 098 3201	PHOTO COUPLE PN150SAN
6	411 015 9801	RING E 2.3
7	613 022 1643	SPRING,LINK L
8	613 022 0073	ASSY,GEAR,LEVER L
9	613 022 2695	RACK
10	613 022 2633	GEAR,LOCK
11	613 021 9916	ASSY,LEVER,PINION
12	613 022 2626	GEAR,PINION
13	613 021 9657	ASSY,BRACKET,GEAR
14	411 027 1305	SCR S-TPG BIN 2.6×4
15	613 006 4479	SPECIAL SWITCH
OR	613 095 0949	SPECIAL SWITCH
16	411 106 9208	SCR PAN+SW+W 2×9
17	613 022 0943	HOLDER,TRANSISTOR
18	613 022 2619	GEAR,IDLER
19	613 022 1667	SPRING,GEAR MAIN
20	613 022 2596	GEAR,MAIN
21	613 022 0097	ASSY,GEAR,LEVER R
22	613 022 1674	SPRING,LINK R
24	613 022 4064	BOARD,UNDER
27	613 124 5006	LEVER,SAFETY SWITCH
28	613 125 6149	SPRING,SAFETY SWITCH
31	411 001 8702	SCR BIN 3×6
40	613 100 0391	ASSY,LEVER,TENSION
41	613 085 7996	SPRING,LEVER TENSION
42	613 021 9701	ASSY,HOLDER,BAND
43	411 144 2803	SCR PAN+SW+W 2.6×6
44	411 109 1605	WASHER Y 2.6×6×0.25
45	613 022 0127	ASSY,REEL,SUPPLY
46	613 022 0110	ASSY,REEL,TAKE UP
47	412 021 5306	SPECIAL WASHER 3.1×6×0.3
OR	412 015 8900	SPECIAL WASHER 3.1×6×0.4
OR	412 015 8504	SPECIAL WASHER 3.1×6×0.5
48	411 109 1506	WASHER Y 2.1×6×0.25
OR	411 109 1407	WASHER Y 2.1×5×0.25
49	613 126 6148	GEAR,REEL SUPPLY
50	412 026 7305	SPECIAL WASHER 2.6×6×0.25
51	613 126 6155	GEAR,REEL TAKE UP
54	412 042 4302	SPECIAL SCREW 2.6×4
55	613 085 7101	COMPL,IDLER,CLUTCH
56	411 120 1301	WASHER Y 2.1×4×0.25
57	613 022 0134	ASSY,IDLER
58	411 021 3107	SCR S-TPG BIN 2.6×8
59	613 120 9053	COMPL,PCB,MC-4
60	407 016 7205	LED LN59
61	613 021 9985	ASSY,SLIDE,ACT PLATE
62	613 021 9992	ASSY,SLIDE,C BRAKE
63	613 022 1612	SPRING,RETURN SLIDE
64	613 022 1506	SPRING,SUB T
65	613 098 0106	ASSY,BRAKE,SUB T
66	613 077 3647	PULLEY,REEL
67	613 022 1490	SPRING,SUB SUPPLY
68	613 022 2374	SLIDE,ACT BRAKE
69	613 084 8871	BRAKE,SUB SUPPLY
70	613 022 0004	ASSY,SLIDE,M PLATE
71	613 080 9216	ASSY,BRAKE,SUPPLY
72	613 086 2914	SPRING,MAIN BRAKE
73	613 080 9209	ASSY,BRAKE,TAKE UP
74	411 109 3005	WASHER Y 2.6×5×0.5
75	613 022 2015	LEVER,CONT PLATE
76	412 015 9501	SPECIAL WASHER
77	411 021 7907	SCR S-TPG BIN 4×12

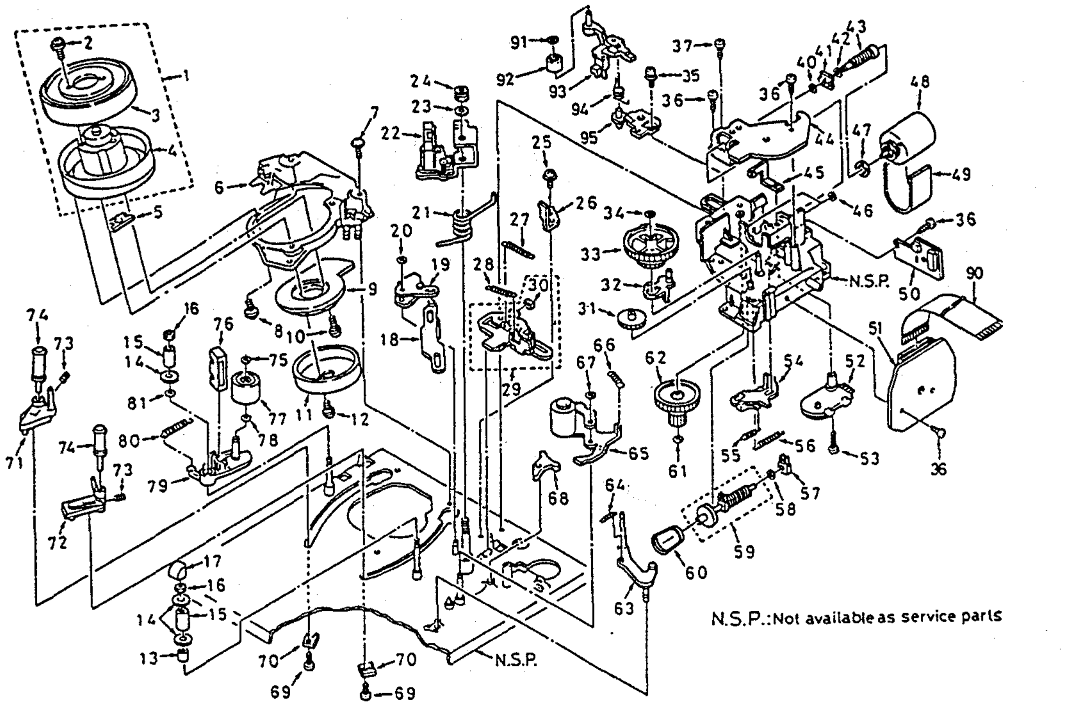


N.S.P.: Not available as service parts



MECHANISM PARTS 2

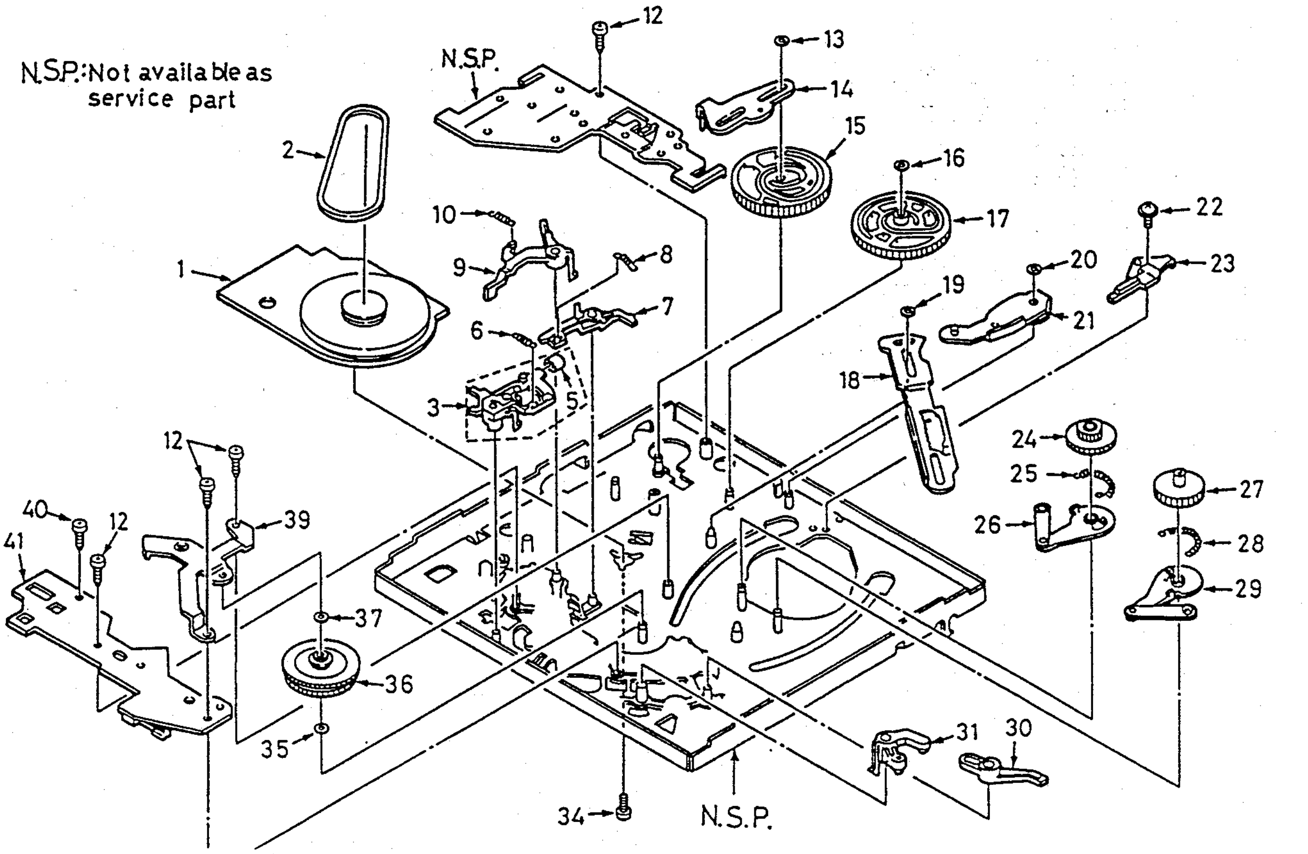
LOCATION	PARTS NO.	DESCRIPTION
1	613 113 1323	COMPL,CYLINDER,2N2P-V
OR	613 125 6033	COMPL,CYLINDER,2N2P-V
OR	613 087 6843	COMPL,CYLINDER,2N2P-V
OR	613 078 8665	COMPL,CYLINDER,2N2P-V
2	411 038 1608	SCR PAN+W 3×8
3	613 078 8672	ASSY,CYLINDER,UPR 2N2P-V
OR	613 087 6850	ASSY,CYLINDER,UPR 2N2P-V
4	613 113 1354	ASSY,CYLINDER,LWR 2AL
OR	613 108 6241	ASSY,CYLINDER,LWR 2AL
OR	613 077 2138	ASSY,CYLINDER,LWR 2
OR	613 022 0271	ASSY,CYLINDER,LWR 2
5	613 107 0509	SPACER,MOTOR,0.5T
6	613 088 9072	BASE,CYLINDER
7	411 047 7509	SCR PAN+FLG 3×6
8	411 047 5000	SCR PAN+FLG 2.6×8
9	613 085 7279	STATOR,MOTOR CYLINDER
10	411 044 9209	SCR PAN+SW 2.3×8
OR	411 044 8301	SCR PAN+SW 2.3×10
11	613 022 4019	ROTOR,MOTOR CYLINDER
12	411 044 9001	SCR PAN+SW 2.3×6
13	613 123 4802	SLEEVE
14	613 053 3227	SPECIAL WASHER
15	613 123 4970	TAPE GUIDE
16	412 026 2607	SPECIAL NUT (M3)
17	613 123 9418	CAP
18	613 021 9961	ASSY,SLIDE,ACT PINCH
19	613 021 9800	ASSY,LEVER,CAM PINCH
20	411 109 2008	WASHER Y 3.1×8×0.5
21	613 022 1797	SPRING,ACE HEAD
22	613 021 9640	COMPL,BRACKET,AC HEAD
23	613 110 1692	SLEEVE,AC HEAD
24	412 015 8207	SPECIAL NUT (M5)
25	411 120 0007	SCR PAN+SW+W 2.6×5
26	613 120 3631	BRACKET,STOPPER
27	613 022 1575	SPRING,LINK LOCK
28	613 022 1582	SPRING,SLIDE BRAKE
29	613 094 9233	ASSY,SLIDE,CAM
30	613 022 2725	DAMPER
31	613 022 2534	GEAR,FRONT LOAD
32	613 094 1206	ASSY,LEVER,FRONT
33	613 077 3586	GEAR,HELICAL FRONT
34	613 027 0504	WASHER 4.1×6.5×0.5
35	411 046 8002	SCR PAN+SW+W 2.6×6
36	411 023 2801	SCR S-TPG PAN 2.6×6
37	411 023 3303	SCR S-TPG PAN 2.6×8
OR	411 021 3107	SCR S-TPG BIN 2.6×8
40	613 053 2381	SPECIAL WASHER
41	613 077 3227	HOLDER,WORM
42	613 027 0382	WASHER
43	613 078 8320	ASSY,WORM,FRONT
44	613 117 0599	BRACKET,HOLDER
45	613 093 9159	PLATE,NUT
46	613 093 8374	DAMPER,MOTOR
47	613 077 3616	DAMPER,WORM
48	613 121 9960	ASSY,LOADING MOTOR
49	613 092 9945	DAMPER,MOTOR
50	613 120 9503	COMPL,PCB,MC-3
51	613 120 9510	COMPL,PCB,MC-2
52	613 110 0374	ROTARY SWITCH
53	411 126 5303	SCR PAN 2.6×13
54	613 092 9921	ASSY,SLIDE,FRONT
55	613 092 5985	SPRING,LEVER LOAD
56	613 092 5992	SPRING,LEVER ACT
57	613 092 5886	HOLDER,WORM
58	613 027 0627	WASHER 2.1×6×0.5
59	613 092 9938	ASSY,WORM,LOAD
60	613 022 2985	BELT,LOADING
61	412 033 4106	WASHER SLIT 2.6×5×0.5
62	613 077 3579	GEAR,HELICAL
63	613 102 9293	ASSY,LEVER,REV GUIDE
64	613 022 1568	SPRING,REVIEW LEVER
65	613 022 0158	COMPL,PINCH ROLLER
66	613 022 1483	SPRING,PINCH ROLLER
67	411 109 2107	WASHER Y 3.6×6×0.5
68	613 078 8160	COMPL,LEVER,ACT BRAKE
69	411 031 1209	SCR BIN 2.6×5
70	613 022 1919	PLATE,GUIDE
71	613 021 9725	ASSY,BASE,ROLLER S
72	613 021 9732	ASSY,BASE,ROLLER T
73	411 063 0904	SCR SET HEX-SCT 2×3
74	613 022 0233	ASSY,GUIDE,ROLLER
75	411 109 2602	WASHER Y 1.5×4×0.25
76	613 022 4224	HEAD,FULL ERASE
77	613 022 2817	IMPEDANCE ROLLER
78	412 032 5807	SPECIAL WASHER 2.1×5×0.13
79	613 093 8305	ASSY,LEVER,FE HEAD
80	613 022 1698	SPRING,ERASE HEAD
81	411 109 1704	WASHER Y 6.4×10×0.25
90	613 120 5703	FLEXIBLE FLAT CABLE 24
91	411 109 1803	WASHER Y 2.6×6×0.5
92	613 119 8562	ASSY,ROLLER,CLEANER
93	613 119 8548	ASSY,LEVER,CLEANER
94	613 119 8593	SPRING
95	613 119 8524	ASSY,BRACKET,CLEANER



N.S.P.:Not available as service parts

MECHANISM PARTS 3

LOCATION	PARTS NO.	DESCRIPTION
1	613 087 8854	MOTOR,CAPSTAN
2	613 022 2978	BELT,REEL DRIVE
3	613 021 9848	ASSY,LEVER,CLUTCH
5	613 079 1023	DAMPER,LEVER CLUTCH
6	613 022 1520	SPRING,LEVER CLUTCH
7	613 082 3434	LEVER,CHANCE CLUTCH
8	613 022 1711	SPRING,CHANGE CLUTCH
9	613 088 5470	ASSY,BRAKE CAPSTAN
10	613 092 7156	SPRING,CAPSTAN
12	411 021 3107	SCR S-TPG BIN 2.6×8
13	411 109 2008	WASHER Y 3.1×8×0.5
14	613 021 9978	ASSY,SLIDE,CAM PLATE
15	613 022 2701	CAM,MODE
16	411 109 1902	WASHER Y 3.1×6×0.5
17	613 120 1576	CAM,MAIN
18	613 022 2664	RACK,LOAD
19	411 109 1803	WASHER Y 2.6×6×0.5
20	411 109 2107	WASHER Y 3.6×6×0.5
OR	411 109 2206	WASHER Y 3.6×8×0.5
21	613 021 9794	ASSY,LEVER,CAM LOAD
22	411 047 6809	SCR PAN+FLG 3×4
23	613 021 9763	ASSY,EARTH,CYLINDER
24	613 090 6380	GEAR,LOAD TAKE UP
25	613 022 1551	SPRING,GEAR LOAD T
26	613 021 9879	ASSY,LEVER,LOAD T
27	613 090 6373	GEAR,LOAD SUPPLY
28	613 022 1704	SPRING,GEAR LOAD S
29	613 021 9862	ASSY,LEVER,LOAD S
30	613 022 2039	LEVER,RETURN TENSION
31	613 091 3104	ASSY,LEVER CONTROL
34	411 040 2303	SCR PAN 2.6×5
35	412 015 8603	SPECIAL WASHER 3.1×6×0.25
36	613 102 0900	ASSY,GEAR FRICTION
37	411 109 1605	WASHER Y 2.6×6×0.25
39	613 079 8121	BRACKET,PULLEY
40	411 100 0300	SCR S-TPG BIN 2.6×5
41	613 120 9060	COMPL,PCB,MC-1
R1	401 026 0607	CARBON 270 JA 1/6W
OR	401 017 0708	CARBON 270 JA 1/4W
R2	401 024 6700	CARBON 100 JA 1/6W
OR	401 012 4404	CARBON 100 JA 1/4W
D1	407 094 1300	PHOTO COUPLE SPI-315-04-C
OR	407 043 0101	PHOTO DIODE ON2170-R
SW1	613 022 4545	SPECIAL SWITCH,EP



ELECTRICAL PARTS

NOTE;

*Materials of Capacitors and Resistors are abbreviated as follows;

Resistors

MT-FILE	Metal Film Resistor
MT-GLAZE	Metal Glaze Resistor
OXIDE-MT	Oxide Metal Film Resistor

Capacitors

MT-POLYEST	Metallized Polyester Capacitor
MT-COMPO	Metallized Composite Capacitor
TA-SOLID	Tantalum Solid Capacitor
AL-SOLID	Aluminum Solid Capacitor
NP-ELECT	Non-Polarized Electrolytic Capacitor
OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
DL-ELECT	Double Layered Electrolytic Capacitor

*Tolerance of Capacitor(10pF over) and Resistor are noted with follow symboles.

F ············ ±1% G ············ ±2% J ············ ±5% K ············ ±10%
M ············ ±20% N ············ ±30% Z ············ +80% ~ −20%

*N.S.P. : Not available as service parts.

LOCATION	PARTS NO.	DESCRIPTION
COMPL PCB,CP-A		
COMPL.NO.	613 125 6613	
VIDEO CIRCUIT(VD-A)		
C1001	403 025 7304	CERAMIC 4.7P K 50V
C1002	403 073 2702	CERAMIC 390P J 50V
C1003	403 026 2209	CERAMIC 47P J 50V
C1004	403 158 5604	NP-ELECT 0.47U M 50V
C1005	403 150 1703	CERAMIC 91P J 50V
C1006	403 071 1509	CERAMIC 180P J 50V
C1007	403 075 4001	CERAMIC 820P J 50V
C1008	403 161 6902	NP-ELECT 2.2U M 50V
C1009	403 001 1906	CERAMIC 0.01U M 16V
C1010	403 191 8808	ELECT 2.2U M 50V
C1011	403 193 8608	ELECT 0.47U M 50V
C1012	403 075 3103	CERAMIC 82P J 50V
C1013	403 068 8801	CERAMIC 100P J 50V
C1014	403 063 2200	POLYESTER 0.068U K 50V
C1015	403 001 1906	CERAMIC 0.01U M 16V
C1016	403 001 1906	CERAMIC 0.01U M 16V
C1017	403 001 1906	CERAMIC 0.01U M 16V
C1018	403 163 7907	ELECT 47U M 6.3V
C1019	403 191 8808	ELECT 2.2U M 50V
C1020	403 139 1502	ELECT 10U M 16V
C1021	403 139 2905	ELECT 2.2U M 50V
C1023	403 001 1906	CERAMIC 0.01U M 16V
C1024	403 162 1807	ELECT 22U M 10V
C1025	403 193 8608	ELECT 0.47U M 50V
C1031	403 001 1906	CERAMIC 0.01U M 16V
C1032	403 135 5009	ELECT 47U M 10V
C1033	403 109 6308	ELECT 1U M 50V
C1034	403 026 2209	CERAMIC 47P J 50V
C1035	403 025 7304	CERAMIC 4.7P K 50V
C1036	403 026 2209	CERAMIC 47P J 50V
C1037	403 121 3002	ELECT 4.7U M 25V
C1038	403 001 1906	CERAMIC 0.01U M 16V
C1039	403 001 1906	CERAMIC 0.01U M 16V
C1040	403 073 6205	CERAMIC 470P J 50V
C1101	403 214 0703	CERAMIC 0.022U J 16V
C1102	403 001 1906	CERAMIC 0.01U M 16V
C1103	403 109 6308	ELECT 1U M 50V
C1104	403 001 1906	CERAMIC 0.01U M 16V
C1105	403 109 6308	ELECT 1U M 50V
C1106	403 109 6308	ELECT 1U M 50V
C1107	403 214 0703	CERAMIC 0.022U J 16V
C1108	403 214 1106	CERAMIC 0.047U J 16V
C1109	403 001 1906	CERAMIC 0.01U M 16V
C1112	403 109 6308	ELECT 1U M 50V
C1113	403 214 1106	CERAMIC 0.047U J 16V
C1114	403 025 8608	CERAMIC 43P J 50V
C1115	403 150 1703	CERAMIC 91P J 50V
C1116	403 001 1906	CERAMIC 0.01U M 16V
C1117	403 163 7907	ELECT 47U M 6.3V
C1118	403 068 8801	CERAMIC 100P J 50V
C1119	403 001 1906	CERAMIC 0.01U M 16V
C1121	403 001 1906	CERAMIC 0.01U M 16V
C1124	403 121 0100	CERAMIC 0.082U J 16V
OR	403 214 1403	CERAMIC 0.082U J 16V
C1125	403 070 3702	CERAMIC 120P J 50V
C1126	403 001 1906	CERAMIC 0.01U M 16V
C1201	403 074 8703	CERAMIC 680P J 50V
C1401	403 139 2202	ELECT 4.7U M 25V
C1605	403 135 4101	ELECT 470U M 6.3V
C1608	403 121 2104	ELECT 22U M 10V
C1609	403 093 9606	OS-SOLID 1U M 16V
C1631	403 022 7703	CERAMIC 33P J 50V
C1632	403 024 1501	CERAMIC 39P J 50V
C1682	403 012 6006	CERAMIC 15P J 50V
CN101	613 120 7875	PLUG,8P
D1001	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1002	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1003	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1004	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1031	407 070 8408	ZENER DIODE GZS9.1Y-TB
OR	407 053 8906	ZENER DIODE MTZ9.1C-T-77
D1603	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1604	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D1651	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
DL131	613 110 0367	DELAY,2H
OR	613 110 1708	DELAY,2H
IC101	409 178 3309	IC LA7340
IC102	409 171 9209	IC LC8992
IC111	409 208 7208	IC LA7332
L1001	613 014 0951	COIL,INDUCTOR 68UHK
OR	613 014 4478	HF CHOKE 68UH K
L1031	613 014 0968	COIL,INDUCTOR 82UHK
OR	613 014 4485	HF CHOKE 82UH K

LOCATION	PARTS NO.	DESCRIPTION
L1032	613 014 0739	COIL,INDUCTOR 1.0UHM
OR	613 014 4256	HF CHOKE 1.0UH M
L1101	613 014 0883	COIL,INDUCTOR 18UHK
OR	613 014 4409	HF CHOKE 18UH K
L1102	613 014 0791	COIL,INDUCTOR 3.3UHK
OR	613 014 4317	HF CHOKE 3.3UH K
L1103	613 014 0876	COIL,INDUCTOR 15UHK
OR	613 014 4393	HF CHOKE 15UH K
L1104	613 014 1019	COIL,INDUCTOR 220UHK
OR	613 014 4539	HF CHOKE 220UH K
L1105	613 014 0920	COIL,INDUCTOR 39UHK
OR	613 014 4447	HF CHOKE 39UH K
L1631	613 014 0975	COIL,INDUCTOR 100UHK
OR	613 014 4492	HF CHOKE 100UH K
L1681	613 014 0777	COIL,INDUCTOR 2.2UHM
OR	613 014 4294	HF CHOKE 2.2UH M
Q1001	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1002	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1003	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1004	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q1031	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1032	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1051	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1101	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q1102	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1103	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1104	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1105	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y
Q1106	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y
Q1151	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1201	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q1401	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
Q1402	405 086 4506	TR KSA643C-Y
OR	405 006 6504	TR 2SA984-E-AA
OR	405 006 6702	TR 2SA984-F-AA
Q1403	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1404	405 009 7003	TR 2SB985-T-AE
Q1601	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1806	TR 2SA933S-T93-R
Q1602	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1631	405 057 6201	TR 2SC4038-Q-TL2
OR	405 057 6409	TR 2SC4038-R-TL2
R1001	401 022 3008	CARBON 6.8K JA 1/4W
R1002	401 017 1705	CARBON 2.7K JA 1/4W
R1003	401 022 1806	CARBON 680 JA 1/4W
R1004	401 012 9201	CARBON 1M JA 1/4W
R1005	401 012 5609	CARBON 1K JA 1/4W
R1006	401 017 1705	CARBON 2.7K JA 1/4W
R1007	401 012 5609	CARBON 1K JA 1/4W
R1008	401 012 5609	CARBON 1K JA 1/4W
R1009	401 012 5609	CARBON 1K JA 1/4W
R1010	401 017 8506	CARBON 300 JA 1/4W
R1011	401 015 2605	CARBON 1.8K JA 1/4W
R1012	401 015 4609	CARBON 180K JA 1/4W
R1013	401 012 9201	CARBON 1M JA 1/4W
R1014	401 016 3700	CARBON 2.2K JA 1/4W
R1015	401 023 2703	CARBON 8.2K JA 1/4W
R1016	401 013 5202	CARBON 1.2K JA 1/4W
R1017	401 018 4804	CARBON 33K JA 1/4W
R1018	401 012 5609	CARBON 1K JA 1/4W
R1019	401 016 2505	CARBON 220 JA 1/4W
R1020	401 020 3802	CARBON 470K JA 1/4W
R1021	401 014 6000	CARBON 150K JA 1/4W
R1022	401 022 1806	CARBON 680 JA 1/4W
R1023	401 016 4707	CARBON 22K JA 1/4W
R1024	401 020 2805	CARBON 47K JA 1/4W
R1025	401 016 3700	CARBON 2.2K JA 1/4W
R1026	401 012 5609	CARBON 1K JA 1/4W
R1031	401 012 5609	CARBON 1K JA 1/4W
R1032	401 020 0702	CARBON 470 JA 1/4W
R1033	401 018 9700	CARBON 39 JA 1/4W
R1034	401 018 9700	CARBON 39 JA 1/4W
R1035	401 018 9700	CARBON 39 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1051	401 012 4404	CARBON 100 JA 1/4W
R1052	401 012 5609	CARBON 1K JA 1/4W
R1101	401 020 2805	CARBON 47K JA 1/4W
R1102	401 016 4707	CARBON 22K JA 1/4W
R1103	401 012 5609	CARBON 1K JA 1/4W
R1104	401 013 5202	CARBON 1.2K JA 1/4W
R1105	401 018 2701	CARBON 330 JA 1/4W
R1106	401 021 1807	CARBON 560 JA 1/4W
R1107	401 012 5609	CARBON 1K JA 1/4W
R1108	401 012 5609	CARBON 1K JA 1/4W
R1109	401 012 6903	CARBON 10K JA 1/4W
R1110	401 023 2703	CARBON 8.2K JA 1/4W
R1111	401 012 5609	CARBON 1K JA 1/4W
R1112	401 015 2605	CARBON 1.8K JA 1/4W
R1113	401 012 8006	CARBON 100K JA 1/4W
R1114	401 019 0904	CARBON 390 JA 1/4W
R1115	401 012 5609	CARBON 1K JA 1/4W
R1116	401 019 1802	CARBON 3.9K JA 1/4W
R1117	401 014 4006	CARBON 1.5K JA 1/4W
R1118	401 022 7105	CARBON 750 JA 1/4W
R1119	401 012 5609	CARBON 1K JA 1/4W
R1120	401 012 4404	CARBON 100 JA 1/4W
R1121	401 012 5609	CARBON 1K JA 1/4W
R1122	401 020 0702	CARBON 470 JA 1/4W
R1123	401 014 4006	CARBON 1.5K JA 1/4W
R1124	401 015 8805	CARBON 200 JA 1/4W
R1125	401 023 1607	CARBON 820 JA 1/4W
R1126	401 012 5609	CARBON 1K JA 1/4W
R1127	401 014 8202	CARBON 160 JA 1/4W
R1128	401 018 2701	CARBON 330 JA 1/4W
R1152	401 012 5609	CARBON 1K JA 1/4W
R1401	401 016 4707	CARBON 22K JA 1/4W
R1402	401 016 4707	CARBON 22K JA 1/4W
R1403	401 020 1907	CARBON 4.7K JA 1/4W
R1404	401 020 1907	CARBON 4.7K JA 1/4W
R1405	401 020 2805	CARBON 47K JA 1/4W
R1406	401 020 2805	CARBON 47K JA 1/4W
R1407	401 015 2605	CARBON 1.8K JA 1/4W
R1408	401 016 2505	CARBON 220 JA 1/4W
R1607	401 021 1807	CARBON 560 JA 1/4W
R1608	401 022 6702	CARBON 75 JA 1/4W
R1609	401 013 9408	CARBON 1.3K JA 1/4W
R1610	401 021 1807	CARBON 560 JA 1/4W
R1631	401 021 2903	CARBON 5.6K JA 1/4W
R1632	401 012 5609	CARBON 1K JA 1/4W
R1633	401 023 1607	CARBON 820 JA 1/4W
R1634	401 015 2605	CARBON 1.8K JA 1/4W
R1641	401 015 2605	CARBON 1.8K JA 1/4W
TH101	407 142 4208	THERMISTOR TD5-C310DB
VR101	613 079 2525	VR.SEMI 1KB
OR	613 120 8537	VR.SEMI 1KB
VR102	613 079 2532	VR.SEMI 10KB
OR	613 120 8544	VR.SEMI 10KB
VR103	613 120 8506	VR.SEMI 4.7KB
OR	613 120 8650	VR.SEMI 4.7KB
VR104	613 079 2532	VR.SEMI 10KB
OR	613 120 8544	VR.SEMI 10KB
VR105	613 079 2525	VR.SEMI 1KB
OR	613 120 8537	VR.SEMI 1KB
X1101	613 080 9407	OSC.CRYSTAL 4.43MHZ
OR	613 093 8008	OSC.CRYSTAL 4.433619MHZ
OR	613 120 8865	OSC.CRYSTAL 4.433619MHZ
XF101	613 004 5539	LC PACK 4MHZ LPF
XF111	613 004 5485	LC PACK

AUDIO CIRCUIT(AD-A)

LOCATION	PARTS NO.	DESCRIPTION
C2001	403 049 1401	ELECT 1U M 50V
C2002	403 075 4506	CERAMIC 820P K 50V
C2004	403 167 6500	ELECT 33U M 6.3V
C2005	403 150 0201	CERAMIC 0.018U K 16V
C2006	403 193 8608	ELECT 0.47U M 50V
C2008	403 001 7601	CERAMIC 4700P M 16V
C2009	403 163 7907	ELECT 47U M 6.3V
C2010	403 107 9905	ELECT 10U M 16V
C2013	403 003 2406	CERAMIC 0.022U J 25V
C2016	403 109 6308	ELECT 1U M 50V
C2017	403 149 0700	ELECT 33U M 16V
C2018	403 191 8600	ELECT 4.7U M 25V
C2019	403 163 8409	ELECT 47U M 16V
C2020	403 071 6207	CERAMIC 220P K 50V
C2021	403 081 7409	POLYPRO 0.033U J 100V
C2022	403 129 0409	CERAMIC 0.01U K 16V
C2024	403 129 0409	CERAMIC 0.01U K 16V
C2025	403 003 3700	CERAMIC 0.022U Z 25V
C2051	403 069 1207	CERAMIC 1000P K 50V
IC201	409 128 4905	IC LA7295
L2002	613 014 3532	HF CHOKE 10000UH J
L2003	613 014 3259	HF CHOKE 560UH K
Q2001	405 024 9709	TR 2SD734-E-AA
OR	405 024 9907	TR 2SD734-F-AA
R2001	401 012 4404	CARBON 100 JA 1/4W
R2002	401 017 1705	CARBON 2.7K JA 1/4W
R2003	401 023 0600	CARBON 82 JA 1/4W
R2004	401 019 3905	CARBON 390K JA 1/4W
R2005	401 021 8905	CARBON 6.2K JA 1/4W
R2006	401 017 1705	CARBON 2.7K JA 1/4W
R2009	401 018 6501	CARBON 3.3M JA 1/4W
R2010	401 012 6903	CARBON 10K JA 1/4W
R2011	401 016 0006	CARBON 20K JA 1/4W
R2012	401 022 7600	CARBON 7.5K JA 1/4W
R2013	401 012 5609	CARBON 1K JA 1/4W
R2014	401 015 2605	CARBON 1.8K JA 1/4W
R2016	401 012 6903	CARBON 10K JA 1/4W
R2017	401 012 6903	CARBON 10K JA 1/4W
R2018	401 015 3701	CARBON 18K JA 1/4W
R2019	401 015 3701	CARBON 18K JA 1/4W
R2021	401 012 3308	CARBON 10 JA 1/4W
R2022	401 019 9501	CARBON 47 JA 1/4W
R2023	401 014 5102	CARBON 15K JA 1/4W
R2024	401 019 6104	CARBON 4.7 JA 1/4W
R2051	401 012 5609	CARBON 1K JA 1/4W
R2091	401 021 8905	CARBON 6.2K JA 1/4W
R2092	401 023 2703	CARBON 8.2K JA 1/4W
R2101	401 012 6903	CARBON 10K JA 1/4W
R2102	401 018 7904	CARBON 3.6K JA 1/4W
R2105	401 012 5609	CARBON 1K JA 1/4W
R2106	401 014 8509	CARBON 1.6K JA 1/4W
R2109	401 012 5609	CARBON 1K JA 1/4W
R2110	401 023 1607	CARBON 820 JA 1/4W
R2116	401 012 5609	CARBON 1K JA 1/4W
T2001	613 016 2205	OSC COIL 70KHZ
OR	613 094 3378	TRANS.OSC 70KHZ
VR201	613 001 9097	SEMI VR 100KB
OR	613 097 7915	VR.SEMI 100KB

SYSTEM CONTROL CIRCUIT(SY-A)

LOCATION	PARTS NO.	DESCRIPTION
C3001	403 017 0207	CERAMIC 20P J 50V
C3002	403 017 9705	CERAMIC 22P J 50V
C3003	403 002 4708	CERAMIC 0.1U Z 25V
C3004	403 002 4708	CERAMIC 0.1U Z 25V
C3005	403 001 1906	CERAMIC 0.01U M 16V
C3006	403 107 9905	ELECT 10U M 16V
C3007	403 070 4105	CERAMIC 120P K 50V
C3008	403 121 9509	CERAMIC 0.1U Z 50V
C3009	403 072 8200	CERAMIC 330P K 50V
C3051	403 001 8806	CERAMIC 6800P K 16V
C3071	403 001 1906	CERAMIC 0.01U M 16V
C3072	403 070 7205	CERAMIC 150P J 50V
C3073	403 001 1906	CERAMIC 0.01U M 16V
C3074	403 001 1906	CERAMIC 0.01U M 16V
C3075	403 001 1906	CERAMIC 0.01U M 16V
C3301	403 135 4101	ELECT 470U M 6.3V
C3302	403 002 4708	CERAMIC 0.1U Z 25V
C3303	403 002 4708	CERAMIC 0.1U Z 25V
CN301	613 120 9176	PLUG,20P
CN302	613 120 9176	PLUG,20P
D3001	407 051 6904	ZENER DIODE GZS5.6Y-BT
OR	407 099 5303	ZENER DIODE MTZJ5.6B-T-77
D3002	407 070 8101	ZENER DIODE GZS8.2Y-BT
OR	407 063 9504	ZENER DIODE MTZJ8.2B-T-77
D3003	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC301	410 124 1102	IC UPD75237GJ-015-5BG
IC302	409 032 3308	IC MN1280-L
OR	409 243 4101	IC MN1380-L
L3071	613 014 0883	COIL,INDUCTOR 18UHK
Q3001	405 018 2808	TR 2SC3402-AC
OR	405 000 3103	TR DTC114ES-DCTP
Q3002	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q3003	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q3004	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q3051	405 063 9807	TR DTC114YL-TL2
Q3071	405 016 1100	TR 2SC2839-F-SPA-AC
OR	405 016 0905	TR 2SC2839-E-SPA-AC
Q3072	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8500	TR 2SC1740S-DCTP-R
R3001	401 018 5702	CARBON 330K JA 1/4W
R3002	401 012 8006	CARBON 100K JA 1/4W
R3003	401 012 8006	CARBON 100K JA 1/4W
R3004	401 012 8006	CARBON 100K JA 1/4W
R3005	401 020 2805	CARBON 47K JA 1/4W
R3006	401 020 2805	CARBON 47K JA 1/4W
R3007	401 014 4006	CARBON 1.5K JA 1/4W
R3008	401 013 6308	CARBON 12K JA 1/4W
R3009	401 020 2805	CARBON 47K JA 1/4W
R3010	401 020 2805	CARBON 47K JA 1/4W
R3012	401 012 6903	CARBON 10K JA 1/4W
R3014	401 020 2805	CARBON 47K JA 1/4W
R3015	401 012 6903	CARBON 10K JA 1/4W
R3016	401 012 6903	CARBON 10K JA 1/4W
R3017	401 012 6903	CARBON 10K JA 1/4W
R3018	401 012 5609	CARBON 1K JA 1/4W
R3020	401 015 1509	CARBON 180 JA 1/4W
R3051	401 012 6903	CARBON 10K JA 1/4W
R3071	401 023 2703	CARBON 8.2K JA 1/4W
R3072	401 016 3700	CARBON 2.2K JA 1/4W
R3073	401 012 5609	CARBON 1K JA 1/4W
R3074	401 018 2701	CARBON 330 JA 1/4W
R3075	401 016 2505	CARBON 220 JA 1/4W
R3076	401 016 5704	CARBON 220K JA 1/4W
R3077	401 017 2702	CARBON 27K JA 1/4W
R3078	401 018 4804	CARBON 33K JA 1/4W
R3079	401 018 4804	CARBON 33K JA 1/4W
R3305	401 012 6903	CARBON 10K JA 1/4W
R3306	401 016 4707	CARBON 22K JA 1/4W
R3307	401 012 6903	CARBON 10K JA 1/4W
X3001	613 089 4069	RESONATOR,CERAMIC 6MHZ
OR	613 108 9570	RESONATOR,CERAMIC 6MHZ
OR	613 122 1444	RESONATOR,CERAMIC 6.0MHZ
OR	613 124 2135	RESONATOR,CERAMIC 6MHZ
X3002	613 109 0972	OSC,CRYSTAL 32KHZ

SERVO CIRCUIT(SV-A)

LOCATION	PARTS NO.	DESCRIPTION
R3701	401 020 1907	CARBON 4.7K JA 1/4W
VR351	613 097 7953	VR,SEMI 220KB
OR	613 001 9110	SEMI VR 220KB

POWER SUPPLY CIRCUIT(PW-A)

LOCATION	PARTS NO.	DESCRIPTION
C5402	403 163 7907	ELECT 47U M 6.3V
CN541	613 120 7882	PLUG,12P
D5403	407 053 3109	ZENER DIODE MTZ12A-T-77
D5404	407 078 2705	DIODE 1SS244-T-77
D5405	407 078 0305	ZENER DIODE MTZ24B-T-77
D5406	407 053 8005	ZENER DIODE MTZ7.5B-T-77
Q5401	405 088 9103	TR 2SA1703-S-AN
Q5402	405 089 2103	TR 2SC4483-S-AN
Q5403	405 006 7006	TR 2SA984K-E-AA
OR	405 006 7204	TR 2SA984K-F-AA
Q5404	405 006 7006	TR 2SA984K-E-AA
OR	405 006 7204	TR 2SA984K-F-AA
R5401	401 021 8905	CARBON 6.2K JA 1/4W
R5402	401 016 3700	CARBON 2.2K JA 1/4W
R5403	401 012 5609	CARBON 1K JA 1/4W
R5404 ⚠	402 041 5608	FUSIBLE RES 820 JA 1/4W
R5405	401 018 3708	CARBON 3.3K JA 1/4W
R5406	401 014 5102	CARBON 15K JA 1/4W
R5407	401 019 7705	CARBON 4.3K JA 1/4W
R5408 ⚠	402 004 1906	FUSIBLE RES 47 JA 1/4W
R5410	401 016 2505	CARBON 220 JA 1/4W
R5411	401 016 2505	CARBON 220 JA 1/4W

TUNER CIRCUIT(TN-A)

LOCATION	PARTS NO.	DESCRIPTION
C6001	403 002 4708	CERAMIC 0.1U Z 25V
C6002	403 121 3002	ELECT 4.7U M 25V
C6003	403 109 6308	ELECT 1U M 50V
C6004	403 067 5603	MT-COMPO 0.1U J 50V
OR	403 065 8002	MT-POLYEST 0.1U J 63V
OR	403 168 6103	MT-POLYEST 0.1U J 50V
C6005	403 121 3002	ELECT 4.7U M 25V
C6006	403 125 5606	ELECT 100U M 16V
C6007	403 143 2809	CERAMIC 0.047U Z 50V
C6008	403 109 6308	ELECT 1U M 50V
C6009	403 135 7409	ELECT 22U M 50V
C6010	403 121 9509	CERAMIC 0.1U Z 50V

LOCATION	PARTS NO.	DESCRIPTION
C6014	403 018 6109	CERAMIC 220P J 50V
C6015	403 002 4708	CERAMIC 0.1U Z 25V
C6017	403 073 6205	CERAMIC 470P J 50V
IC601	409 026 8203	IC L5631
OR	409 057 5103	IC UPC574J
IC602	409 148 5005	IC M6M80021P
OR	409 199 5306	IC M6M80011AP
OR	409 247 9706	IC XRM9021B
L6003	613 014 0852	COIL.INDUCTOR 10UHK
OR	613 014 4379	HF CHOKE 10UH K
L6005	613 014 0852	COIL.INDUCTOR 10UHK
OR	613 014 4379	HF CHOKE 10UH K
L6006	613 014 0852	COIL.INDUCTOR 10UHK
OR	613 014 4379	HF CHOKE 10UH K
L6007	613 014 0821	COIL.INDUCTOR 5.6UHK
L6008	613 014 0852	COIL.INDUCTOR 10UHK
OR	613 014 4379	HF CHOKE 10UH K
Q6001	405 027 8709	TR 2SK68A-K
OR	405 057 9301	TR 2SK68A-L1
OR	405 040 0605	TR 2SK222-C
OR	405 026 9004	TR 2SK222-D
Q6002	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q6003	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q6004	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 093 0607	TR KSC2785-Y
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q6005	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
OR	405 063 9104	TR DTA144EL-TL2
Q6006	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
R6001	401 018 2701	CARBON 330 JA 1/4W
R6002	401 019 0904	CARBON 390 JA 1/4W
R6003	401 012 9201	CARBON 1M JA 1/4W
R6004	401 019 3905	CARBON 390K JA 1/4W
R6005	401 020 3802	CARBON 470K JA 1/4W
R6006	401 019 3905	CARBON 390K JA 1/4W
R6007	401 016 8705	CARBON 240K JA 1/4W
R6008	401 012 5609	CARBON 1K JA 1/4W
R6010	401 012 6903	CARBON 10K JA 1/4W
R6011	401 012 8006	CARBON 100K JA 1/4W
R6012	401 012 8006	CARBON 100K JA 1/4W
R6014	401 015 9406	CARBON 2K JA 1/4W

RF CONVERTER CIRCUIT(CV-A)

LOCATION	PARTS NO.	DESCRIPTION
C6601	403 134 8100	ELECT 100U M 6.3V
L6601	613 015 6631	COIL.INDUCTOR 15UHK
OR	613 014 8667	HF CHOKE 15UH K
L6602	613 015 6631	COIL.INDUCTOR 15UHK
OR	613 014 8667	HF CHOKE 15UH K

COMPL PCB,VD-1

COMPL.NO. 613 120 6076

LOCATION	PARTS NO.	DESCRIPTION
B1701	405 018 2402	TR 2SC3398-TB
OR	405 000 2908	TR DTC114EK-T96
C1701	403 069 5601	CERAMIC 0.01U K 50V
C1702	403 033 4609	CERAMIC 82P J 50V
OR	403 033 6603	CERAMIC 82P J 50V
C1703	403 189 2405	ELECT 10U M 16V
C1704	403 068 0409	CERAMIC 0.1U Z 25V
C1705	403 189 2405	ELECT 10U M 16V
C1706	403 069 5601	CERAMIC 0.01U K 50V
D1701	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC171	409 003 4907	IC BA7025L
J1701	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
Q1701	405 015 9701	TR 2SC2814-F4-TB
OR	405 035 6100	TR 2SC2413K-T96-Q
R1701	401 037 5608	MT-GLAZE 10K JA 1/10W
R1702	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R1703	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1704	401 037 5400	MT-GLAZE 1K JA 1/10W
R1705	401 038 0800	MT-GLAZE 22K JA 1/10W
R1706	401 037 5400	MT-GLAZE 1K JA 1/10W
R1707	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1708	401 037 8104	MT-GLAZE 150K JA 1/10W
R1709	401 038 5805	MT-GLAZE 430 JA 1/10W
R1710	401 038 0800	MT-GLAZE 22K JA 1/10W
R1711	401 037 5608	MT-GLAZE 10K JA 1/10W
XF171	613 084 1681	FILTER 4.16MHZ B.F
XF172	613 015 8604	CHOKE COIL

COMPL PCB,VP-1

COMPL.NO. 613 120 6212

LOCATION	PARTS NO.	DESCRIPTION
C1801	403 069 1207	CERAMIC 1000P K 50V
C1803	403 154 3307	OS-SOLID 4.7U M 10V
C1804	403 073 6205	CERAMIC 470P J 50V
C1805	403 075 3103	CERAMIC 82P J 50V
C1806	403 001 1906	CERAMIC 0.01U M 16V
C1807	403 001 1906	CERAMIC 0.01U M 16V
C1808	403 001 5409	CERAMIC 0.022U M 16V
C1809	403 163 8409	ELECT 47U M 16V
C1810	403 001 1906	CERAMIC 0.01U M 16V
C1811	403 001 5409	CERAMIC 0.022U M 16V
C1812	403 191 8709	ELECT 1U M 50V
C1813	403 162 2903	CERAMIC 2200P M 16V
C1814	403 114 5808	CERAMIC 0.033U M 16V
C1815	403 026 2209	CERAMIC 47P J 50V
C1816	403 026 2209	CERAMIC 47P J 50V
C1817	403 114 5808	CERAMIC 0.033U M 16V
C1818	403 162 2903	CERAMIC 2200P M 16V
C1851	403 071 1509	CERAMIC 180P J 50V
C1852	403 074 8703	CERAMIC 680P J 50V
C1853	403 017 9705	CERAMIC 22P J 50V
C1855	403 028 3402	CERAMIC 56P J 50V
C1856	403 001 1906	CERAMIC 0.01U M 16V
C1857	403 001 1906	CERAMIC 0.01U M 16V
C1858	403 068 8801	CERAMIC 100P J 50V
C1859	403 026 2209	CERAMIC 47P J 50V
C1860	403 001 1906	CERAMIC 0.01U M 16V
C1861	403 001 1906	CERAMIC 0.01U M 16V

LOCATION	PARTS NO.	DESCRIPTION
C1862	403 139 1007	ELECT 47U M 6.3V
CN181	613 120 7899	SOCKET.8P
D1851	407 077 3109	DIODE SB0015-03A-BT
D1852	407 077 3109	DIODE SB0015-03A-BT
IC181	409 134 2001	IC LA7320
L1801	613 014 0968	COIL,INDUCTOR 82UHK
OR	613 014 4485	HF CHOKE 82UH K
L1802	613 014 0951	COIL,INDUCTOR 68UHK
OR	613 014 4478	HF CHOKE 68UH K
L1851	613 014 0975	COIL,INDUCTOR 100UHK
OR	613 014 4492	HF CHOKE 100UH K
L1852	613 014 0951	COIL,INDUCTOR 68UHK
OR	613 014 4478	HF CHOKE 68UH K
L1855	613 014 8223	HF CHOKE 56UH J
OR	613 015 6174	COIL,INDUCTOR 56UHJ
L1856	613 014 8216	HF CHOKE 47UH J
OR	613 015 6167	COIL,INDUCTOR 47UHJ
Q1851	405 012 9506	TR 2SC2058S-DCTP-Q
OR	405 015 2504	TR 2SC2669-O-TPE4
OR	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1852	405 093 0508	TR KSA1175-Y
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1853	405 012 9506	TR 2SC2058S-DCTP-Q
OR	405 015 2504	TR 2SC2669-O-TPE4
OR	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1854	405 012 9506	TR 2SC2058S-DCTP-Q
OR	405 015 2504	TR 2SC2669-O-TPE4
OR	405 015 2603	TR 2SC2669-Y-TPE4
OR	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
R1801	401 013 5202	CARBON 1.2K JA 1/4W
R1802	401 015 1509	CARBON 180 JA 1/4W
R1803	401 016 2505	CARBON 220 JA 1/4W
R1804	401 020 5509	CARBON 5.1 JA 1/4W
R1805	401 015 2605	CARBON 1.8K JA 1/4W
R1851	401 020 0702	CARBON 470 JA 1/4W
R1852	401 016 4707	CARBON 22K JA 1/4W
R1853	401 016 4707	CARBON 22K JA 1/4W
R1854	401 019 0904	CARBON 390 JA 1/4W
R1855	401 019 0904	CARBON 390 JA 1/4W
R1856	401 015 2605	CARBON 1.8K JA 1/4W
R1860	401 012 4404	CARBON 100 JA 1/4W
R1861	401 018 3708	CARBON 3.3K JA 1/4W
R1862	401 017 2702	CARBON 27K JA 1/4W
R1863	401 020 0702	CARBON 470 JA 1/4W
R1865	401 019 0904	CARBON 390 JA 1/4W
R1866	401 015 9406	CARBON 2K JA 1/4W
R1867	401 017 2702	CARBON 27K JA 1/4W
R1868	401 020 0702	CARBON 470 JA 1/4W
R1870	401 015 2605	CARBON 1.8K JA 1/4W
R1881	401 021 1807	CARBON 560 JA 1/4W
VR181	613 002 0321	SEMI VR 470B
OR	613 117 1787	VR.SEMI 470B
VR182	613 002 0345	SEMI VR 1KB
OR	613 117 1664	VR.SEMI 1KB

COMPL PCB,CP-2

COMPL.NO. 613 124 8649

SYSTEM CONTROL CIRCUIT(SY-B)

LOCATION	PARTS NO.	DESCRIPTION
C3201	403 130 9408	NP-ELECT 10U M 25V
C3202	403 069 1207	CERAMIC 1000P K 50V
C3203	403 121 3408	ELECT 2.2U M 50V
C3204	403 002 2506	CERAMIC 0.01U M 25V
C3205	403 002 4708	CERAMIC 0.1U Z 25V
D3201	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC321	409 114 4803	IC LB1641
Q3201	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
R3201	401 020 1907	CARBON 4.7K JA 1/4W
R3202	401 020 1907	CARBON 4.7K JA 1/4W
R3203	401 020 1907	CARBON 4.7K JA 1/4W
R3204	401 020 1907	CARBON 4.7K JA 1/4W
R3205	401 020 1907	CARBON 4.7K JA 1/4W
R3206	401 020 2805	CARBON 47K JA 1/4W
R3207	401 018 4804	CARBON 33K JA 1/4W
R3208	401 014 7106	CARBON 1.5M JA 1/4W
R3209	401 016 4707	CARBON 22K JA 1/4W
R3210	401 012 6903	CARBON 10K JA 1/4W
R3211	401 012 6903	CARBON 10K JA 1/4W
R3212	402 036 3701	FUSIBLE RES 3.3 JA 1/2W
OR	402 036 4401	FUSIBLE RES 3.3 JA 1/2W
R3213	401 022 7105	CARBON 750 JA 1/4W
R3216	401 012 6903	CARBON 10K JA 1/4W
R3218	401 016 0402	CARBON 200K JA 1/4W
R3219	401 016 0402	CARBON 200K JA 1/4W
R3220	401 020 2805	CARBON 47K JA 1/4W
R3221	401 020 2805	CARBON 47K JA 1/4W

SERVO CIRCUIT(SV-B)

LOCATION	PARTS NO.	DESCRIPTION
C3501	403 001 1609	CERAMIC 0.01U K 16V
C3502	403 001 1609	CERAMIC 0.01U K 16V
C3503	403 002 8508	CERAMIC 0.015U K 25V
C3504	403 042 8803	ELECT 22U M 16V
C3505	403 042 8803	ELECT 22U M 16V
C3506	403 001 8806	CERAMIC 6800P K 16V
C3507	403 042 8803	ELECT 22U M 16V
C3508	403 042 8803	ELECT 22U M 16V
C3509	403 135 4002	ELECT 47U M 6.3V
C3510	403 002 4708	CERAMIC 0.1U Z 25V
C3511	403 120 7506	CERAMIC 220P K 50V
C3512	403 061 4107	POLYESTER 0.039U K 50V
C3513	403 119 6701	CERAMIC 0.068U K 16V
C3514	403 168 6103	MT-POLYEST 0.1U J 50V
OR	403 067 5603	MT-COMPO 0.1U J 50V
C3515	403 063 0107	POLYESTER 6800P K 50V
C3516	403 069 1207	CERAMIC 1000P K 50V
C3517	403 069 1207	CERAMIC 1000P K 50V
C3518	403 135 4002	ELECT 47U M 6.3V
C3519	403 002 4708	CERAMIC 0.1U Z 25V
C3520	403 175 1009	MT-POLYEST 0.15U J 50V
OR	403 067 6204	MT-COMPO 0.15U J 50V
C3521	403 109 6308	ELECT 1U M 50V
C3522	403 001 7908	CERAMIC 0.047U K 16V
C3523	403 109 6308	ELECT 1U M 50V
C3524	403 001 1609	CERAMIC 0.01U K 16V
C3525	403 161 7305	NP-ELECT 0.22U M 50V
C3526	403 004 0500	CERAMIC 0.047U K 25V

LOCATION	PARTS NO.	DESCRIPTION
C3527	403 134 5505	ELECT 10U M 25V
C3528	403 134 5505	ELECT 10U M 25V
C3529	403 121 2401	ELECT 22U M 16V
C3530	403 134 9602	ELECT 47U M 16V
C3532	403 063 7700	POLYESTER 0.082U K 50V
C3534	403 001 7908	CERAMIC 0.047U K 16V
C3535	403 001 7908	CERAMIC 0.047U K 16V
C3536	403 134 9602	ELECT 47U M 16V
C3537	403 001 7403	CERAMIC 4700P K 16V
C3538	403 135 3500	ELECT 220U M 6.3V
C3539	403 121 3408	ELECT 2.2U M 50V
C3540	403 001 6604	CERAMIC 3300P M 16V
C3542	403 109 6308	ELECT 1U M 50V
D3501	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3502	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3503	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3504	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3505	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3506	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3507	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3508	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3509	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3510	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3511	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3512	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3513	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
IC351	409 251 4506	IC XRU2797S
Q3501	405 000 6104	TR DTC144ES-DCTP
OR	405 018 2501	TR 2SC3399-AC
Q3502	405 000 6104	TR DTC144ES-DCTP
OR	405 018 2501	TR 2SC3399-AC
Q3505	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
R3501	401 020 2805	CARBON 47K JA 1/4W
R3502	401 020 2805	CARBON 47K JA 1/4W
R3503	401 018 5702	CARBON 330K JA 1/4W
R3504	401 014 6000	CARBON 150K JA 1/4W
R3505	401 014 5102	CARBON 15K JA 1/4W
R3506	401 014 6000	CARBON 150K JA 1/4W
R3507	401 022 4005	CARBON 68K JA 1/4W
R3508	401 017 2702	CARBON 27K JA 1/4W
R3509	401 016 4707	CARBON 22K JA 1/4W
R3510	401 016 4707	CARBON 22K JA 1/4W
R3511	401 012 8006	CARBON 100K JA 1/4W
R3512	401 012 5609	CARBON 1K JA 1/4W
R3513	401 012 8006	CARBON 100K JA 1/4W
R3514	401 012 8006	CARBON 100K JA 1/4W
R3516	401 020 2805	CARBON 47K JA 1/4W
R3517	401 018 4804	CARBON 33K JA 1/4W
R3518	401 018 4804	CARBON 33K JA 1/4W
R3519	401 018 5702	CARBON 330K JA 1/4W
R3520	401 014 6000	CARBON 150K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R3521	401 012 6903	CARBON 10K JA 1/4W
R3522	401 014 6000	CARBON 150K JA 1/4W
R3523	401 012 9201	CARBON 1M JA 1/4W
R3524	401 016 4707	CARBON 22K JA 1/4W
R3525	401 017 0708	CARBON 270 JA 1/4W
R3526	401 016 3700	CARBON 2.2K JA 1/4W
R3527	401 017 0708	CARBON 270 JA 1/4W
R3528	401 021 1807	CARBON 560 JA 1/4W
R3529	401 021 1807	CARBON 560 JA 1/4W
R3530	401 023 4509	CARBON 820K JA 1/4W
R3531	401 012 8006	CARBON 100K JA 1/4W
R3532	401 013 1808	CARBON 11K JA 1/4W
R3534	401 017 0708	CARBON 270 JA 1/4W
R3535	401 017 0708	CARBON 270 JA 1/4W
R3536	401 013 5202	CARBON 1.2K JA 1/4W
R3537	401 023 2703	CARBON 8.2K JA 1/4W
R3538	401 023 2703	CARBON 8.2K JA 1/4W
R3539	401 012 8006	CARBON 100K JA 1/4W
R3542	401 013 6308	CARBON 12K JA 1/4W
R3543	401 018 3708	CARBON 3.3K JA 1/4W
R3544	401 020 1907	CARBON 4.7K JA 1/4W
R3545	401 012 5609	CARBON 1K JA 1/4W

COMPL PCB,PW-1

COMPL.NO.	613 123 5274	
	613 041 5967	COVER
C5101	403 110 1705	ELECT 2200U M 25V
OR	403 148 0701	ELECT 2200U M 25V
C5102	403 110 1705	ELECT 2200U M 25V
OR	403 148 0701	ELECT 2200U M 25V
C5103	403 160 6804	ELECT 3300U M 16V
OR	403 158 0500	ELECT 3300U M 16V
C5104	403 157 0006	ELECT 47U M 63V
C5105	403 195 5100	ELECT 47U M 100V
OR	403 155 5805	ELECT 47U M 100V
C5106	403 168 6103	MT-POLYEST 0.1U J 50V
C5107	403 135 9403	ELECT 47U M 35V
C5108	403 107 9905	ELECT 10U M 16V
C5109	403 107 9905	ELECT 10U M 16V
CN511	613 120 7905	SOCKET,12P
D5101	407 004 9600	DIODE DSF10TC-BT
D5102	407 004 9600	DIODE DSF10TC-BT
D5103	407 132 7400	DIODE GP30DL-6326
OR	407 145 5004	DIODE ERC01-02FL9
D5104	407 132 7400	DIODE GP30DL-6326
OR	407 145 5004	DIODE ERC01-02FL9
D5105	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5106	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5107	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5108	407 004 9709	DIODE DSK10C-BT
OR	407 088 6502	DIODE MPG06D-PKG3
OR	407 005 8701	DIODE ERA15-02-V5
D5109	407 078 2705	DIODE 1SS244-T-77
D5110	407 078 2705	DIODE 1SS244-T-77
F5001 ⚠	423 004 6708	FUSE 250V0.315A
F5101 ⚠	423 004 3004	FUSE 250V 0.8A
F5102 ⚠	423 005 4901	FUSE 250V 1.6A
F5103 ⚠	423 006 1305	FUSE 250V 2A

LOCATION	PARTS NO.	DESCRIPTION
F5104 ⚠	423 004 6708	FUSE 250V0.315A
L5001	613 080 0664	LF CHOKE
OR	613 119 9828	COIL,LINE FILTER
R5101	401 007 8608	CARBON 1.5K JA 1/2W
R5102	401 007 8608	CARBON 1.5K JA 1/2W

COMPL PCB,PW-2

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 120 6182	
IC521	409 214 4208	IC STK5446

COMPL PCB,PW-3

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 120 6199	
CN531	613 120 7912	CONNECTOR,INLET

IF PACK

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 107 0547	
C6103	403 021 0200	CERAMIC 3P C 50V
C6104	403 021 0200	CERAMIC 3P C 50V
C6105	403 006 6203	CERAMIC 1P C 50V
C6106	403 006 6203	CERAMIC 1P C 50V
C6107	403 071 8102	CERAMIC 2200P K 50V
C6108	403 069 1702	CERAMIC 1000P K 50V
C6109	403 023 4404	CERAMIC 330P J 50V
C6110	403 071 8102	CERAMIC 2200P K 50V
C6113	403 075 0706	CERAMIC 6800P K 50V
C6114	403 034 1409	CERAMIC 9P C 50V
C6115	403 070 9803	CERAMIC 0.015U K 50V
C6116	403 049 1005	ELECT 1U M 50V
C6117	403 069 1702	CERAMIC 1000P K 50V
C6119	403 075 0706	CERAMIC 6800P K 50V
C6120	403 053 9707	ELECT 4.7U M 35V
C6121	403 075 5305	CERAMIC 8200P K 50V
C6122	403 041 9603	ELECT 10U M 16V
C6123	403 075 0706	CERAMIC 6800P K 50V
C6124	403 069 5601	CERAMIC 0.01U K 50V
C6125	403 033 4500	CERAMIC 82P J 50V
C6127	403 022 8205	CERAMIC 33P J 50V
C6128	403 075 0706	CERAMIC 6800P K 50V
C6129	403 043 9700	ELECT 47U M 16V
C6130	403 017 0900	CERAMIC 20P J 50V
C6133	403 014 3409	CERAMIC 18P J 50V
C6134	403 026 2803	CERAMIC 47P J 50V
C6137	403 033 4708	CERAMIC 82P J 50V
C6138	403 075 0706	CERAMIC 6800P K 50V
C6139	403 047 9201	ELECT 0.1U M 50V
C6141	403 069 5601	CERAMIC 0.01U K 50V
C6142	403 075 0706	CERAMIC 6800P K 50V
C6143	403 012 6808	CERAMIC 15P J 50V
IC611	409 019 3307	IC LA7530N
L6102	613 014 0746	COIL,INDUCTOR 1.2UHM
L6103	613 098 8393	COIL,CHOKE 1.2UH
L6105	613 014 0869	COIL,INDUCTOR 12UHK
L6106	613 014 0869	COIL,INDUCTOR 12UHK
L6107	613 014 0869	COIL,INDUCTOR 12UHK
L6108	613 014 0913	COIL,INDUCTOR 33UHK
L6109	613 014 0845	COIL,INDUCTOR 8.2UHK
Q6101	405 015 5505	TR 2SC2757-T1B-T33
Q6102	405 002 0209	TR 2SA1037K-Q
Q6103	405 021 2406	TR 2SD1048-X7-TB
R6101	401 037 7206	MT-GLAZE 130 JA 1/10W
R6102	401 014 2804	CARBON 150 JA 1/4W
R6103	401 038 0602	MT-GLAZE 220 JA 1/10W
R6104	401 037 7800	MT-GLAZE 150 JA 1/10W
R6105	401 039 0205	MT-GLAZE 82 JA 1/10W
R6106	401 038 9704	MT-GLAZE 7.5K JA 1/10W
R6107	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R6108	401 037 5400	MT-GLAZE 1K JA 1/10W
R6109	401 038 0503	MT-GLAZE 22 JA 1/10W
R6110	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R6111	401 038 6307	MT-GLAZE 470 JA 1/10W
R6112	401 038 2002	MT-GLAZE 270 JA 1/10W
R6113	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R6114	401 038 7205	MT-GLAZE 5.1K JA 1/10W
R6115	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R6116	401 038 0800	MT-GLAZE 22K JA 1/10W
R6117	401 012 5609	CARBON 1K JA 1/4W
R6118	401 038 4105	MT-GLAZE 3.6K JA 1/10W
R6119	401 037 5400	MT-GLAZE 1K JA 1/10W
R6120	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R6121	401 038 2002	MT-GLAZE 270 JA 1/10W
R6124	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R6126	401 037 7800	MT-GLAZE 150 JA 1/10W
R6128	401 037 5202	MT-GLAZE 100 JA 1/10W
R6129	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R6130	401 037 5202	MT-GLAZE 100 JA 1/10W
R6132	401 037 7503	MT-GLAZE 130K JA 1/10W
R6133	401 037 5400	MT-GLAZE 1K JA 1/10W
R6134	401 012 6903	CARBON 10K JA 1/4W
R6135	401 037 8104	MT-GLAZE 150K JA 1/10W
R6136	401 038 0008	MT-GLAZE 200 JA 1/10W
R6137	401 037 7800	MT-GLAZE 150 JA 1/10W
R6138	401 037 7800	MT-GLAZE 150 JA 1/10W
T6101	613 098 8355	TRANS,IF
T6102	613 098 8362	TRANS,IF
T6103	613 098 8379	TRANS,IF
T6104	613 098 8386	TRANS,IF
VR611	613 001 9035	SEMI VR 10KB
XF611	421 002 9509	SAW F TSF1338L
XF612	613 084 1728	FILTER
XF613	613 110 1050	FILTER
XF614	613 084 1674	FILTER
XF615	613 098 8317	DISCR,CERAMIC 5.74M

COMPL PCB,TN-7

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 127 8028	
B6901	405 018 1900	TR 2SC3395-TB
OR	405 029 3504	TR DTC144EK-T96
C6901	403 068 0409	CERAMIC 0.1U Z 25V
OR	403 116 2508	CERAMIC 0.1U Z 25V
C6902	403 189 2405	ELECT 10U M 16V
C6903	403 072 3403	CERAMIC 0.022U Z 50V
C6904	403 193 8400	ELECT 0.22U M 50V
C6921	403 068 0409	CERAMIC 0.1U Z 25V
OR	403 116 2508	CERAMIC 0.1U Z 25V
C6922	403 014 9203	CERAMIC 180P J 50V
C6923	403 069 1702	CERAMIC 1000P K 50V
C6924	403 067 7300	MT-COMPO 0.33U J 50V
OR	403 115 1007	MT-POLYEST 0.33U J 63V
OR	403 168 6202	MT-POLYEST 0.33U J 50V
C6925	403 067 6709	MT-COMPO 0.22U J 50V
OR	403 065 8101	MT-POLYEST 0.22U J 63V
OR	403 184 9805	MT-POLYEST 0.22U J 50V
D6901	407 004 0706	DIODE DCB015-TB

LOCATION	PARTS NO.	DESCRIPTION
D6901	407 003 3609	DIODE DAN202K-T-96
D6902	407 003 5108	DIODE DA204K-T96
IC691	409 019 6209	IC LA7910
J6901	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
Q6901	405 015 8308	TR 2SC2812-L4-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 015 8704	TR 2SC2812-L6-TB
Q6902	405 030 7201	TR 2SA1338-4-TB
OR	405 030 7300	TR 2SA1338-5-TB
Q6903	405 015 8308	TR 2SC2812-L4-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 015 8704	TR 2SC2812-L6-TB
Q6921	405 084 8209	TR 2SC2960-F-SPA-AC
OR	405 084 8308	TR 2SC2960-G-SPA-AC
R6901	401 037 5400	MT-GLAZE 1K JA 1/10W
R6902	401 038 3504	MT-GLAZE 330 JA 1/10W
R6903	401 038 8509	MT-GLAZE 620 JA 1/10W
R6904	401 037 5608	MT-GLAZE 10K JA 1/10W
R6905	401 038 3801	MT-GLAZE 330K JA 1/10W
R6906	401 037 5608	MT-GLAZE 10K JA 1/10W
R6907	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R6908	401 039 0205	MT-GLAZE 82 JA 1/10W
R6909	401 037 5400	MT-GLAZE 1K JA 1/10W
R6910	401 038 7106	MT-GLAZE 510 JA 1/10W
R6911	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R6912	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R6921	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R6922	401 038 3702	MT-GLAZE 33K JA 1/10W
R6923	401 037 5608	MT-GLAZE 10K JA 1/10W
R6924	401 037 5608	MT-GLAZE 10K JA 1/10W
R6925	401 037 9309	MT-GLAZE 18K JA 1/10W
R6926	401 037 8005	MT-GLAZE 15K JA 1/10W
R6927	401 037 6803	MT-GLAZE 12K JA 1/10W
T6901	613 109 0958	TRANS.IF
OR	613 109 0965	TRANS.IF

COMPL PCB,TM-1

COMPL.NO. 613 123 2334

LOCATION	PARTS NO.	DESCRIPTION
	613 121 6617	HOLDER.DIGITRON
A7001	613 113 2672	FLUORESCENT TUBE
C7001	403 155 2804	DL-ELECT 0.047F Z 5.5V
OR	403 212 9104	DL-ELECT 0.1F Z 5.5V
D7001	407 120 5807	DIODE AK04-V2
D7006	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7007	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7009	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7010	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7011	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D7013	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7034	407 007 9904	DIODE GMA01-BT
D7034	407 012 4406	DIODE 1SS133-T-77
R7001	401 012 5609	CARBON 1K JA 1/4W
R7002	401 012 5609	CARBON 1K JA 1/4W
R7003	401 012 5609	CARBON 1K JA 1/4W
R7004	401 012 5609	CARBON 1K JA 1/4W
R7005	401 012 5609	CARBON 1K JA 1/4W
RR701	613 122 9198	IR RECEIVER PACK UNIT
S7001	613 006 3649	PUSH SWITCH.REW
OR	613 079 4130	SW.PUSH.REW
OR	613 092 1734	SW.PUSH.REW
OR	613 092 0751	SW.PUSH.REW
S7002	613 006 3649	PUSH SWITCH.FF
OR	613 079 4130	SW.PUSH.FF
OR	613 092 1734	SW.PUSH.FF
OR	613 092 0751	SW.PUSH.FF
S7005	613 006 3649	PUSH SWITCH.CH UP
OR	613 079 4130	SW.PUSH.CH UP
OR	613 092 1734	SW.PUSH.CH UP
OR	613 092 0751	SW.PUSH.CH UP
S7006	613 079 4130	SW.PUSH.TR+
OR	613 092 1734	SW.PUSH.TR+
OR	613 092 0751	SW.PUSH.TR+
OR	613 006 3649	PUSH SWITCH.TR+
S7011	613 006 3649	PUSH SWITCH.PLAY
OR	613 079 4130	SW.PUSH.PLAY
OR	613 092 1734	SW.PUSH.PLAY
OR	613 092 0751	SW.PUSH.PLAY
S7012	613 006 3649	PUSH SWITCH.STOP
OR	613 079 4130	SW.PUSH.STOP
OR	613 092 1734	SW.PUSH.STOP
OR	613 092 0751	SW.PUSH.STOP
S7015	613 006 3649	PUSH SWITCH.CH DOWN
OR	613 079 4130	SW.PUSH.CH DOWN
OR	613 092 1734	SW.PUSH.CH DOWN
OR	613 092 0751	SW.PUSH.CH DOWN
S7016	613 006 3649	PUSH SWITCH.TR-
OR	613 079 4130	SW.PUSH.TR-
OR	613 092 1734	SW.PUSH.TR-
OR	613 092 0751	SW.PUSH.TR-
S7018	613 006 3649	PUSH SWITCH.S.T.ADJ
OR	613 079 4130	SW.PUSH.S.T.ADJ
OR	613 092 1734	SW.PUSH.S.T.ADJ
OR	613 092 0751	SW.PUSH.S.T.ADJ
S7021	613 006 3649	PUSH SWITCH.REC
OR	613 079 4130	SW.PUSH.REC
OR	613 092 1734	SW.PUSH.REC
OR	613 092 0751	SW.PUSH.REC
S7022	613 006 3649	PUSH SWITCH.P/S
OR	613 079 4130	SW.PUSH.P/S
OR	613 092 1734	SW.PUSH.P/S
OR	613 092 0751	SW.PUSH.P/S
S7024	613 006 3649	PUSH SWITCH.PRESET
OR	613 079 4130	SW.PUSH.PRESET
OR	613 092 1734	SW.PUSH.PRESET
OR	613 092 0751	SW.PUSH.PRESET
S7025	613 006 3649	PUSH SWITCH.OK
OR	613 079 4130	SW.PUSH.OK
OR	613 092 1734	SW.PUSH.OK
OR	613 092 0751	SW.PUSH.OK
S7026	613 006 3649	PUSH SWITCH.DIMMER
OR	613 079 4130	SW.PUSH.DIMMER
OR	613 092 1734	SW.PUSH.DIMMER
OR	613 092 0751	SW.PUSH.DIMMER
S7032	613 006 3649	PUSH SWITCH.POWER
OR	613 079 4130	SW.PUSH.POWER
OR	613 092 1734	SW.PUSH.POWER

LOCATION	PARTS NO.	DESCRIPTION
S7032	613 092 0751	SW,PUSH,POWER
S7051	613 006 3649	PUSH SWITCH,ALL CLEAR
OR	613 079 4130	SW,PUSH,ALL CLEAR
OR	613 092 1734	SW,PUSH,ALL CLEAR
OR	613 092 0751	SW,PUSH,ALL CLEAR
VR701	613 091 5450	VR,ROTARY 10KB

COMPL PCB,TM-2

COMPL.NO. 613 123 2358

LOCATION	PARTS NO.	DESCRIPTION
S7102	613 006 3649	PUSH SWITCH,EJECT
OR	613 079 4130	SW,PUSH,EJECT
OR	613 092 1734	SW,PUSH,EJECT
OR	613 092 0751	SW,PUSH,EJECT

COMPL,TM-8

COMPL.NO. 613 108 5534

LOCATION	PARTS NO.	DESCRIPTION
C7802	403 013 3103	CERAMIC 150P J 50V
C7803	403 067 7300	MT-COMPO 0.33U J 50V
OR	403 115 1007	MT-POLYEST 0.33U J 63V
OR	403 168 6202	MT-POLYEST 0.33U J 50V
C7804	403 057 2407	POLYESTER 0.1U J 50V
C7805	403 068 0409	CERAMIC 0.1U Z 25V
C7806	403 193 7502	ELECT 22U M 6.3V
IC781	409 148 5104	IC SDA5642
Q7801	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
R7801	401 038 6307	MT-GLAZE 470 JA 1/10W
R7802	401 037 5400	MT-GLAZE 1K JA 1/10W
R7803	401 037 5400	MT-GLAZE 1K JA 1/10W
R7804	401 037 9101	MT-GLAZE 180 JA 1/10W
R7805	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R7806	401 037 5806	MT-GLAZE 1M JA 1/10W
R7807	401 039 0601	MT-GLAZE 820K JA 1/10W
R7808	401 037 5707	MT-GLAZE 100K JA 1/10W
R7809	401 037 5608	MT-GLAZE 10K JA 1/10W
R7810	401 037 7008	MT-GLAZE 1.2M JA 1/10W
R7811	401 037 5202	MT-GLAZE 100 JA 1/10W
R7812	401 038 7700	MT-GLAZE 5.6K JA 1/10W

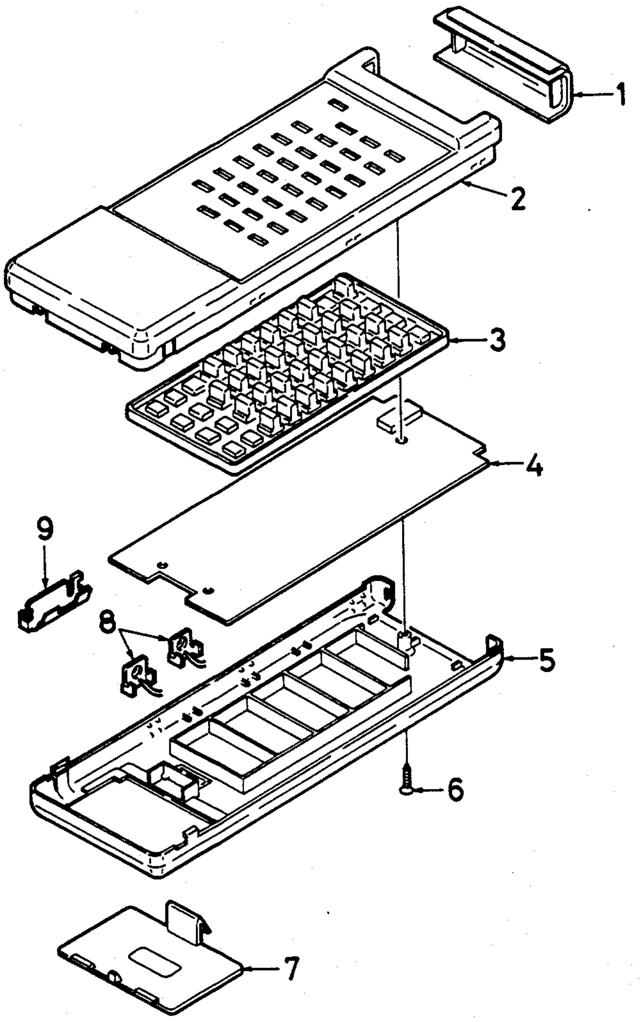
COMPL PCB,TB-1

COMPL.NO. 613 125 3902

LOCATION	PARTS NO.	DESCRIPTION
C8501	403 189 2405	ELECT 10U M 16V
C8503	403 189 2405	ELECT 10U M 16V
C8507	403 189 2405	ELECT 10U M 16V
C8531	403 163 8409	ELECT 47U M 16V
C8551	403 069 1207	CERAMIC 1000P K 50V
C8552	403 069 1207	CERAMIC 1000P K 50V
C8601	403 158 5604	NP-ELECT 0.47U M 50V
C8602	403 189 2405	ELECT 10U M 16V
C8604	403 093 8104	OS-SOLID 4.7U M 10V
C8605	403 068 9402	CERAMIC 100P K 50V
CN871	613 105 6633	SOCKET,21P
OR	613 077 0905	SOCKET,21P
D8601	407 070 7104	ZENER DIODE GZS5.6X-BT
OR	407 053 6704	ZENER DIODE MTZ5.6B-T-77
D8651	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D8652	407 007 9904	DIODE GMA01-BT

LOCATION	PARTS NO.	DESCRIPTION
D8652	407 012 4406	DIODE 1SS133-T-77
IC851	409 182 9007	IC NJM2234L
IC861	409 120 3401	IC LA7221
OR	409 003 4501	IC BA7021
L8551	613 014 0739	COIL,INDUCTOR 1.0UHM
OR	613 014 4256	HF CHOKE 1.0UH K
Q8511	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q8601	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 093 0607	TR KSC2785-Y
Q8602	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
Q8651	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 093 0508	TR KSA1175-Y
Q8652	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
R8501	401 017 2702	CARBON 27K JA 1/4W
R8503	401 017 9701	CARBON 30K JA 1/4W
R8507	401 017 1705	CARBON 2.7K JA 1/4W
R8508	401 017 1705	CARBON 2.7K JA 1/4W
R8511	401 018 4804	CARBON 33K JA 1/4W
R8512	401 012 5609	CARBON 1K JA 1/4W
R8531	401 015 1509	CARBON 180 JA 1/4W
R8601	401 012 6903	CARBON 10K JA 1/4W
R8602	401 020 1907	CARBON 4.7K JA 1/4W
R8603	401 022 6702	CARBON 75 JA 1/4W
R8604	401 012 5609	CARBON 1K JA 1/4W
R8606	401 012 5609	CARBON 1K JA 1/4W
R8607	401 020 1907	CARBON 4.7K JA 1/4W
R8651	401 012 6903	CARBON 10K JA 1/4W
R8652	401 012 5609	CARBON 1K JA 1/4W
R8653	401 021 2903	CARBON 5.6K JA 1/4W
R8654	401 021 2903	CARBON 5.6K JA 1/4W
R8655	401 016 4707	CARBON 22K JA 1/4W
R8656	401 021 0602	CARBON 56 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
REMOCON		
COMPL.NO.	613 124 3156	
1	613 040 5395	SIGN WINDOW
2	613 125 1120	ASSY.CABINET.TOP
3	613 124 6249	BUTTON
4	613 123 4048	COMPL.RM-1
5	613 040 0703	BOTTOM LID
6	411 101 7506	SCR S-TPG FLT 2.6X12
7	613 040 1663	BATTERY LID
8	613 052 5390	TERMINAL(INCLUDE RM-1)
9	613 052 5383	TERMINAL



LOCATION	PARTS NO.	DESCRIPTION
COMPL.RM-1		
COMPL.NO.	613 123 4048	
C1	403 009 3100	CERAMIC 100P J 50V
C2	403 009 3100	CERAMIC 100P J 50V
C3	403 039 2104	ELECT 47U M 6.3V
C4	403 001 2903	CERAMIC 0.1U M 16V
IC1	410 122 2101	IC UPD6600GS-535
LED1	407 040 3709	LED SLR-932A
Q1	405 066 7305	TR 2SC4040-R
OR	405 015 3006	TR 2SC2673-R
OR	405 015 3105	TR 2SC2673-S
R1	401 015 6405	CARBON 2.2 JA 1/4W
X1	613 016 6913	CERAMIC RESONATOR
OR	613 016 6920	CERAMIC RESONATOR

BLOCK DIAGRAMS, CIRCUIT DIAGRAMS & PRINTED CIRCUIT BOARDS

TABLE OF CONTENTS

Page

OVERALL WIRING DIAGRAM 1
MECHANISM CONNECTION CIRCUIT DIAGRAM 3

VIDEO CIRCUIT BASIC BLOCK DIAGRAM 4

SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM 7

AUDIO CIRCUIT BASIC BLOCK DIAGRAM 10
CP-1 P.C.B. 11

CP-1 BOARD (PW-A) POWER SUPPLY CIRCUIT DIAGRAM 13
PW-1,2,3 BOARD POWER SUPPLY CIRCUIT DIAGRAM & P.C.B. 14

CP-1 BOARD (VD-A) VIDEO CIRCUIT DIAGRAM 16
WAVEFORM OF VIDEO 18

VD-1 BOARD MESECAM DISCRIMINATION CIRCUIT DIAGRAM & P.C.B. 19
VP-1 BOARD VIDEO PRE-AMP CIRCUIT DIAGRAM & P.C.B. 20

TB-1 BOARD TERMINAL CIRCUIT DIAGRAM & P.C.B. 22
CP-1 BOARD (AD-A) AUDIO CIRCUIT DIAGRAM 23

CP-1 BOARD (TN-A) TUNER IF CONNECTION CIRCUIT DIAGRAM 25
CP-1 BOARD (CV-A) RF CONVERTER CONNECTION CIRCUIT DIAGRAM 25
TN-7 BOARD SYNC DET. & TUNING CONTROL CIRCUIT DIAGRAM & P.C.B. 26
TM-8 BOARD VPS CIRCUIT DIAGRAM & P.C.B. 26

CP-1 BOARD (SY-A, SV-A) SYSTEM CONTROL CIRCUIT DIAGRAM 28
WAVEFORM OF SERVO 30

CP-2 BOARD (SY-B, SV-B) SERVO CIRCUIT DIAGRAM 31
CP-2 P.C.B. 33

TM-1 BOARD OPERATION KEY & DISPLAY (FLD) CIRCUIT DIAGRAM & P.C.B. 34
TM-2 BOARD OPERATION CIRCUIT DIAGRAM & P.C.B. 34

IR REMOTE CONTROL CIRCUIT DIAGRAM 37

IF CIRCUIT DIAGRAM & P.C.B. 40
RF CONVERTER CIRCUIT DIAGRAM 41

IC301 SYSTEM CONTROL/TIMER/TUNING CONTROL MPU PIN FUNCTIONS TABLE 43

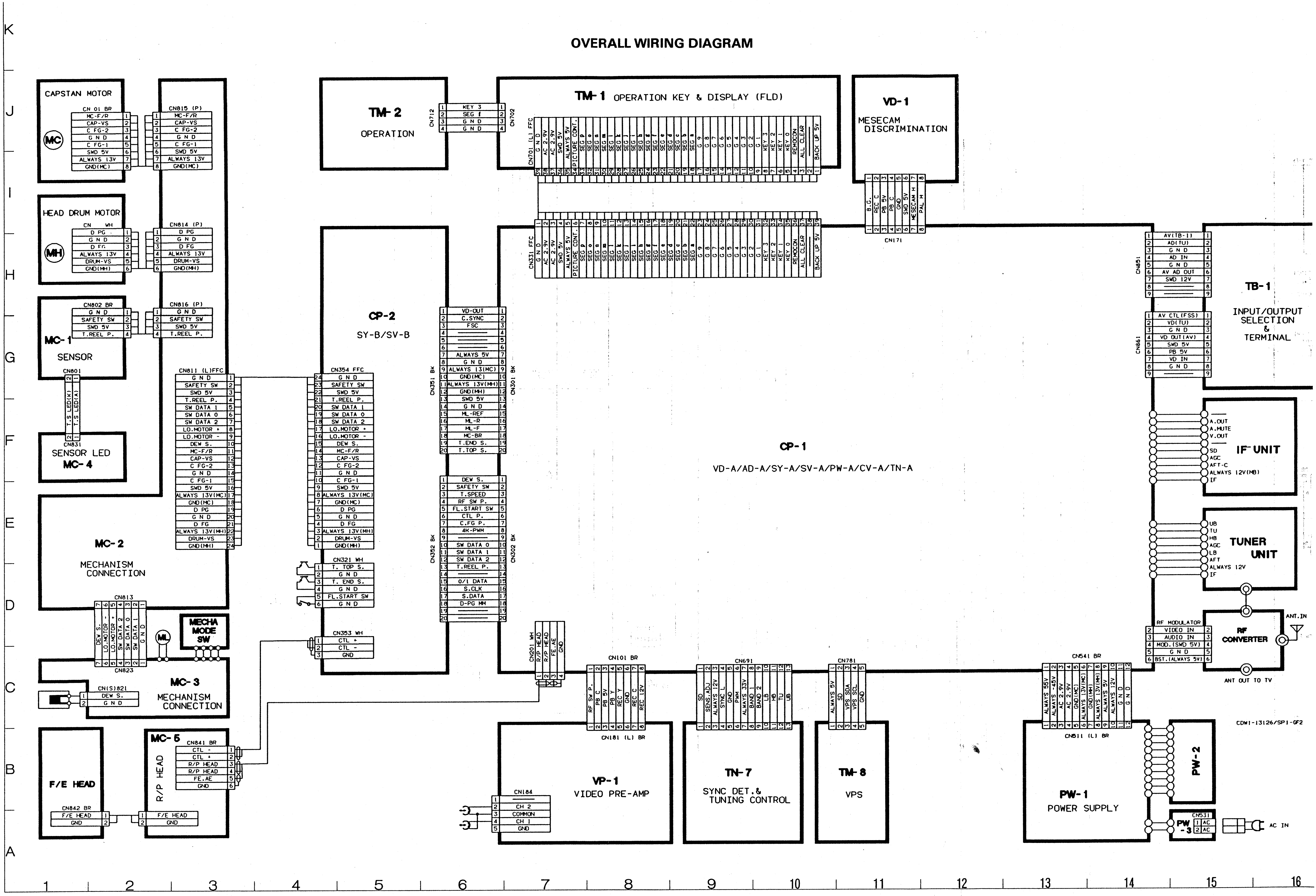
NOTES:

1. All resistance values in "OHMS" unless otherwise noted. (K = 1,000 M = 1,000,000)
2. All capacitance values in "μfd" unless otherwise noted.
   p = pico farad
3. All inductance values in "mH" unless otherwise noted. μ = micro henry.

PRODUCT SAFETY NOTICE

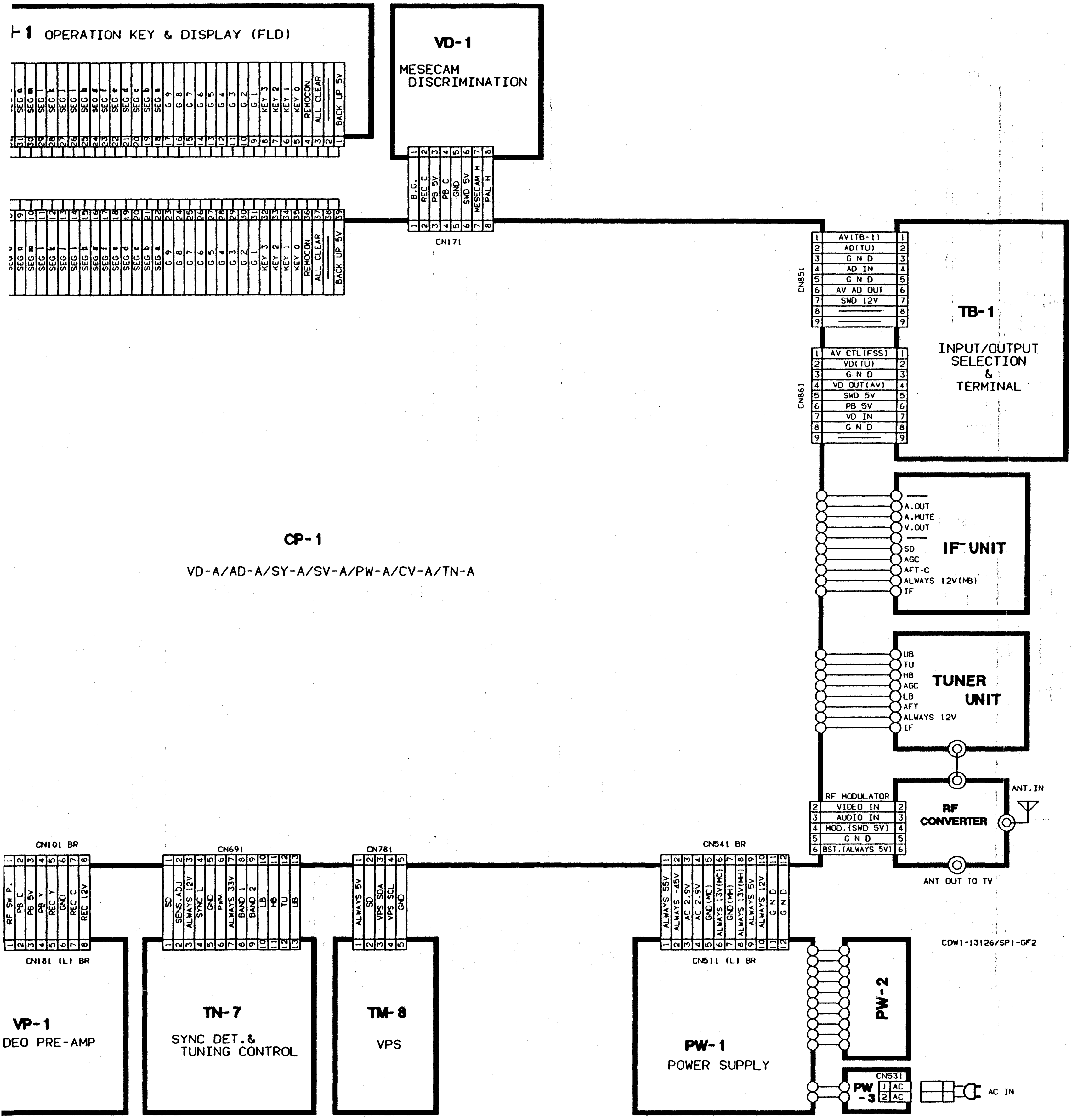
THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SYMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTNACE, WATTAGE AND VOLTAGE RATINGS SHOWN.

OVERALL WIRING DIAGRAM

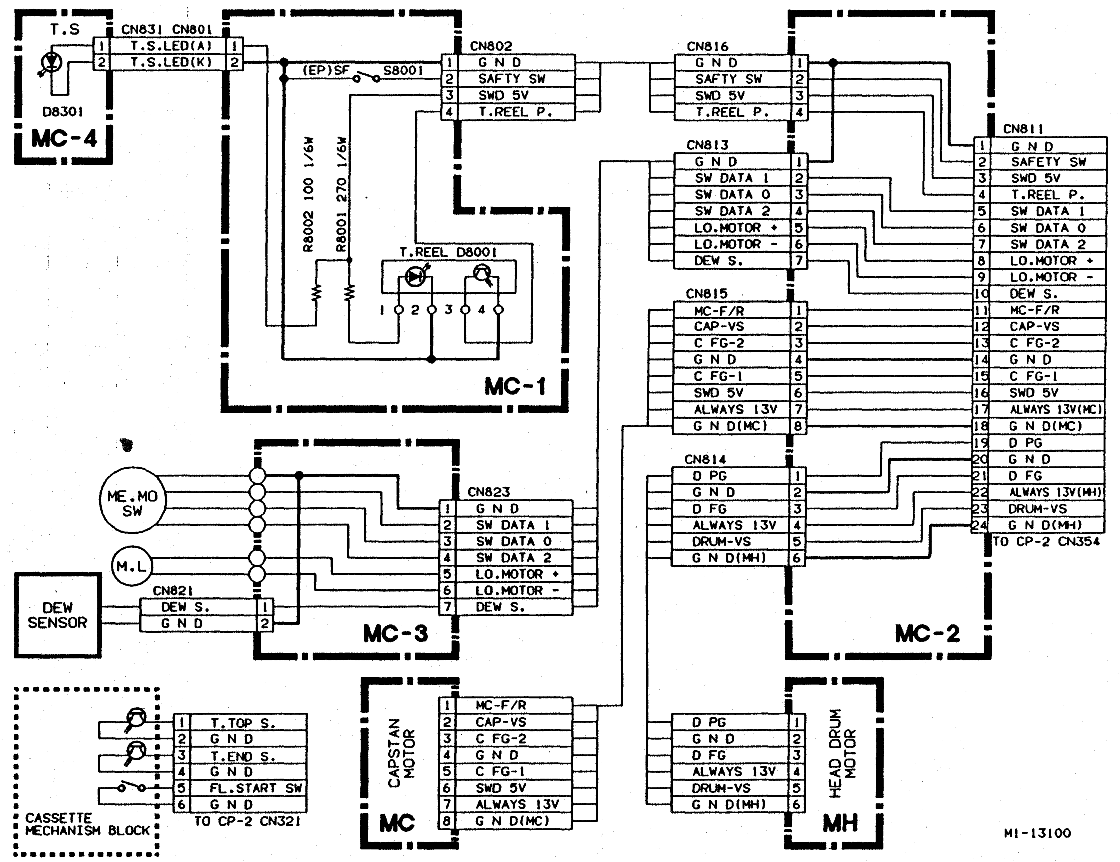


CAPSTAN MOTOR
MC
CN 01 BR
MC-F/R
CAP-VS
C FG-2
G N D
C FG-1
SWD 5V
ALWAYS 13V
GND(MC)
CN815 (P)
HEAD DRUM MOTOR
MH
CN WH
D PG
G N D
D FG
ALWAYS 13V
DRUM-VS
GND(MH)
CN814 (P)
CN802 BR
SAFETY SW
SWD 5V
T.REEL P.
CN816 (P)
MC-1
SENSOR
CN801
T.S LED(K)
T.S LED(A)
CN831
SENSOR LED
MC-4
CN811 (L)FFC
SW DATA 1
SW DATA 0
SW DATA 2
LO.MOTOR +
LO.MOTOR −
DEW S.
ALWAYS 13V(MC)
ALWAYS 13V(MH)
MC-2
MECHANISM CONNECTION
CN813
CN823
ML
MECHA MODE SW
MC-3
MECHANISM CONNECTION
CN(S)821
DEW S.
F/E HEAD
CN842 BR
F/E HEAD
GND
MC-5
R/P HEAD
CN841 BR
CTL −
CTL +
R/P HEAD
FE.AE
TM-2
OPERATION
CN712
KEY 3
SEG f
CN702
TM-1 OPERATION KEY & DISPLAY (FLD)
CN701 (L) FFC
AC 2.9V
ALWAYS 5V
PICTURE CONT.
SEG p
SEG n
SEG m
SEG k
SEG j
SEG h
SEG g
SEG e
SEG d
SEG c
SEG b
SEG a
G 9
G 8
G 7
G 6
G 5
G 4
G 3
G 2
G 1
KEY 3
KEY 2
KEY 1
KEY 0
REMOCON
ALL CLEAR
BACK UP 5V
CN331 FFC
VD-1
MESECAM DISCRIMINATION
B.G.
REC C
PB 5V
PB C
GND
SWD 5V
MESECAM H
PAL H
CN171
CP-2
SY-B/SV-B
CN354 FFC
CN321 WH
T. TOP S.
T. END S.
FL.START SW
CN353 WH
CTL +
CTL −
CN351 BK
CN301 BK
VD-OUT
C.SYNC
FSC
ALWAYS 5V
ALWAYS 13(MC)
ALWAYS 13V(MH)
ML-REF
ML-R
ML-F
MC-BR
T.END S.
T.TOP S.
CN352 BK
CN302 BK
T.SPEED
RF SW P.
FL.START SW
CTL P.
C.FG P.
4K-PWM
SW DATA 0
SW DATA 1
SW DATA 2
T.REEL P.
0/1 DATA
S.CLK
S.DATA
D-PG MM
CP-1
VD-A/AD-A/SY-A/SV-A/PW-A/CV-A/TN-A
CN201 WH
CN851
AV(TB-1)
AD(TU)
AD IN
AV AD OUT
SWD 12V
CN861
AV CTL(FSS)
VD(TU)
VD OUT(AV)
PB 5V
VD IN
TB-1
INPUT/OUTPUT SELECTION & TERMINAL
A.OUT
A.MUTE
V.OUT
SD
AGC
AFT-C
ALWAYS 12V(MB)
IF
IF UNIT
UB
TU
HB
LB
AFT
ALWAYS 12V
TUNER UNIT
RF MODULATOR
VIDEO IN
AUDIO IN
MOD.(SWD 5V)
BST.(ALWAYS 5V)
RF CONVERTER
ANT.IN
ANT OUT TO TV
CN101 BR
RF SW P.
PB C
PB 5V
PB Y
REC Y
REC C
REC 12V
CN181 (L) BR
VP-1
VIDEO PRE-AMP
CN184
CH 2
COMMON
CH 1
CN691
SENS.ADJ
ALWAYS 12V
SYNC L
PWM
ALWAYS 33V
BAND 1
BAND 2
TN-7
SYNC DET.& TUNING CONTROL
CN781
VPS SDA
VPS SCL
TM-8
VPS
CN541 BR
ALWAYS 55V
ALWAYS −45V
ALWAYS 13V(MC)
GND(MC)
ALWAYS 13V(MH)
GND(MH)
CN511 (L) BR
PW-1
POWER SUPPLY
PW-2
PW-3
CN531
AC
AC IN
CDW1-13126/SP1-GF2
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

ERALL WIRING DIAGRAM

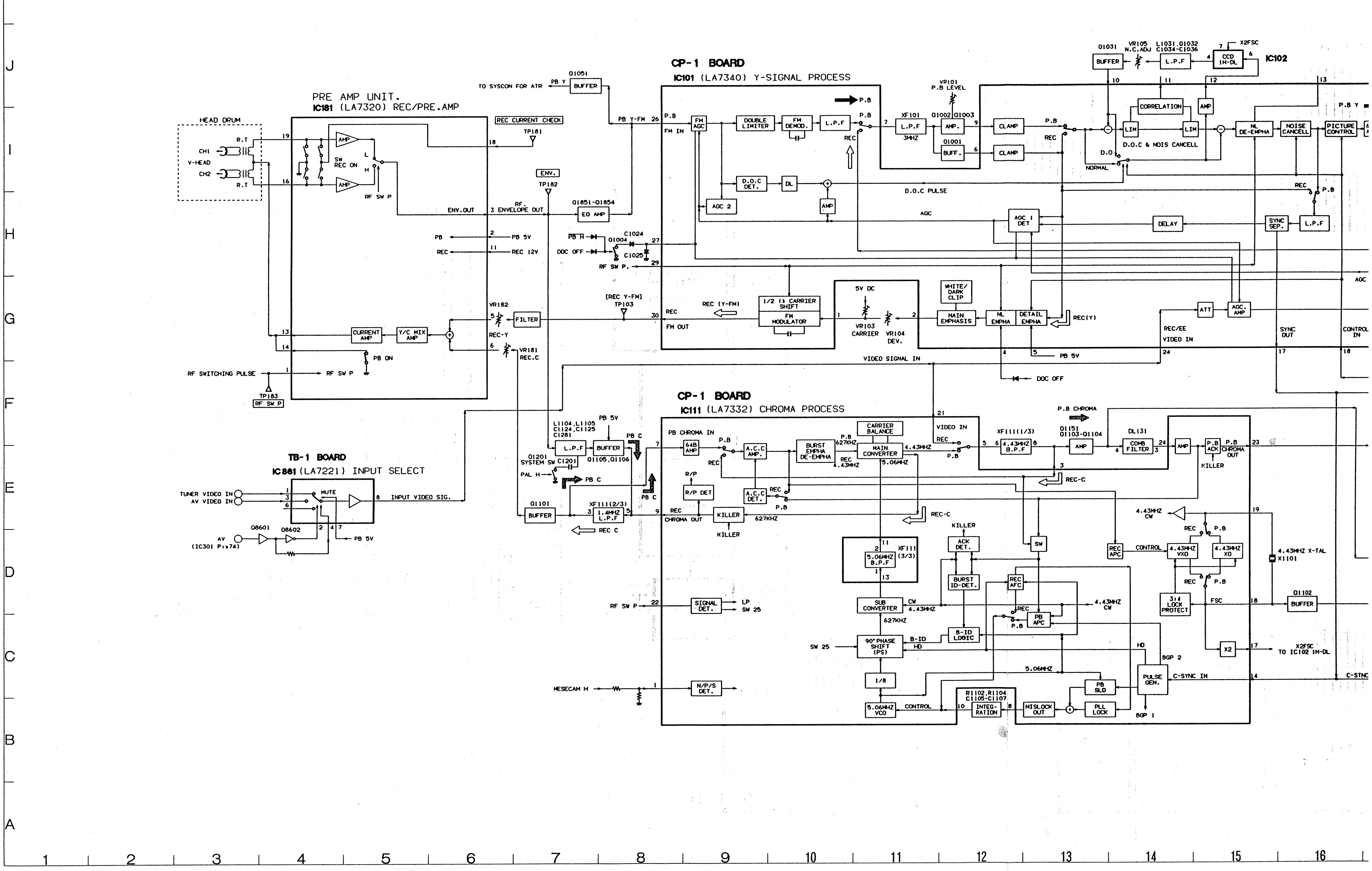

⊢1 OPERATION KEY & DISPLAY (FLD)
SEG a
SEG m
SEG l
SEG k
SEG j
SEG i
SEG h
SEG g
SEG f
SEG e
SEG d
SEG c
SEG b
SEG a
G 9
G 8
G 7
G 6
G 5
G 4
G 3
G 2
G 1
KEY 3
KEY 2
KEY 1
KEY 0
REMOCON
ALL CLEAR
BACK UP 5V
VD-1
MESECAM DISCRIMINATION
B.G.
REC C
PB 5V
PB C
GND
SWD 5V
MESECAM H
PAL H
CN171
CN851
AV(TB-1)
AD(TU)
G N D
AD IN
G N D
AV AD OUT
SWD 12V
TB-1
INPUT/OUTPUT SELECTION & TERMINAL
CN861
AV CTL(FSS)
VD(TU)
G N D
VD OUT(AV)
SWD 5V
PB 5V
VD IN
G N D
A.OUT
A.MUTE
V.OUT
SD
AGC
AFT-C
ALWAYS 12V(MB)
IF
IF UNIT
UB
TU
HB
AGC
LB
AFT
ALWAYS 12V
IF
TUNER UNIT
CP-1
VD-A/AD-A/SY-A/SV-A/PW-A/CV-A/TN-A
RF MODULATOR
VIDEO IN
AUDIO IN
MOD.(SWD 5V)
G N D
BST.(ALWAYS 5V)
RF CONVERTER
ANT.IN
ANT OUT TO TV
CN101 BR
RF SW P.
PB C
PB 5V
PB Y
REC Y
GND
REC C
REC 12V
CN181 (L) BR
VP-1
DEO PRE-AMP
CN691
SD
SENS.ADJ
ALWAYS 12V
SYNC L
GND
PWM
ALWAYS 33V
BAND 1
BAND 2
LB
HB
TU
UB
TN-7
SYNC DET.& TUNING CONTROL
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
GND
TM-8
VPS
CN541 BR
ALWAYS 55V
ALWAYS -45V
AC 2.9V
AC 2.9V
GND(MC)
ALWAYS 13V(MC)
GND(MH)
ALWAYS 13V(MH)
ALWAYS 5V
ALWAYS 12V
G N D
G N D
CN511 (L) BR
PW-1
POWER SUPPLY
PW-2
CN531
PW -3
AC
AC
AC IN
CDW1-13126/SP1-GF2

MECHANISM CONNECTION CIRCUIT DIAGRAM


T.S
D8301
MC-4
CN831 CN801
T.S.LED(A)
T.S.LED(K)
(EP)SF
S8001
R8002 100 1/6W
R8001 270 1/6W
T.REEL D8001
MC-1
CN802
G N D
SAFTY SW
SWD 5V
T.REEL P.
CN816
G N D
SAFTY SW
SWD 5V
T.REEL P.
CN813
G N D
SW DATA 1
SW DATA 0
SW DATA 2
LO.MOTOR +
LO.MOTOR -
DEW S.
CN815
MC-F/R
CAP-VS
C FG-2
G N D
C FG-1
SWD 5V
ALWAYS 13V
G N D(MC)
CN814
D PG
G N D
D FG
ALWAYS 13V
DRUM-VS
G N D(MH)
CN811
G N D
SAFETY SW
SWD 5V
T.REEL P.
SW DATA 1
SW DATA 0
SW DATA 2
LO.MOTOR +
LO.MOTOR -
DEW S.
MC-F/R
CAP-VS
C FG-2
G N D
C FG-1
SWD 5V
ALWAYS 13V(MC)
G N D(MC)
D PG
G N D
D FG
ALWAYS 13V(MH)
DRUM-VS
G N D(MH)
TO CP-2 CN354
MC-2
ME.MO SW
M.L
DEW SENSOR
CN821
DEW S.
G N D
CN823
G N D
SW DATA 1
SW DATA 0
SW DATA 2
LO.MOTOR +
LO.MOTOR -
DEW S.
MC-3
T.TOP S.
G N D
T.END S.
G N D
FL.START SW
G N D
TO CP-2 CN321
CASSETTE MECHANISM BLOCK
CAPSTAN MOTOR
MC
MC-F/R
CAP-VS
C FG-2
G N D
C FG-1
SWD 5V
ALWAYS 13V
G N D(MC)
HEAD DRUM MOTOR
MH
D PG
G N D
D FG
ALWAYS 13V
DRUM-VS
G N D(MH)
M1-13100

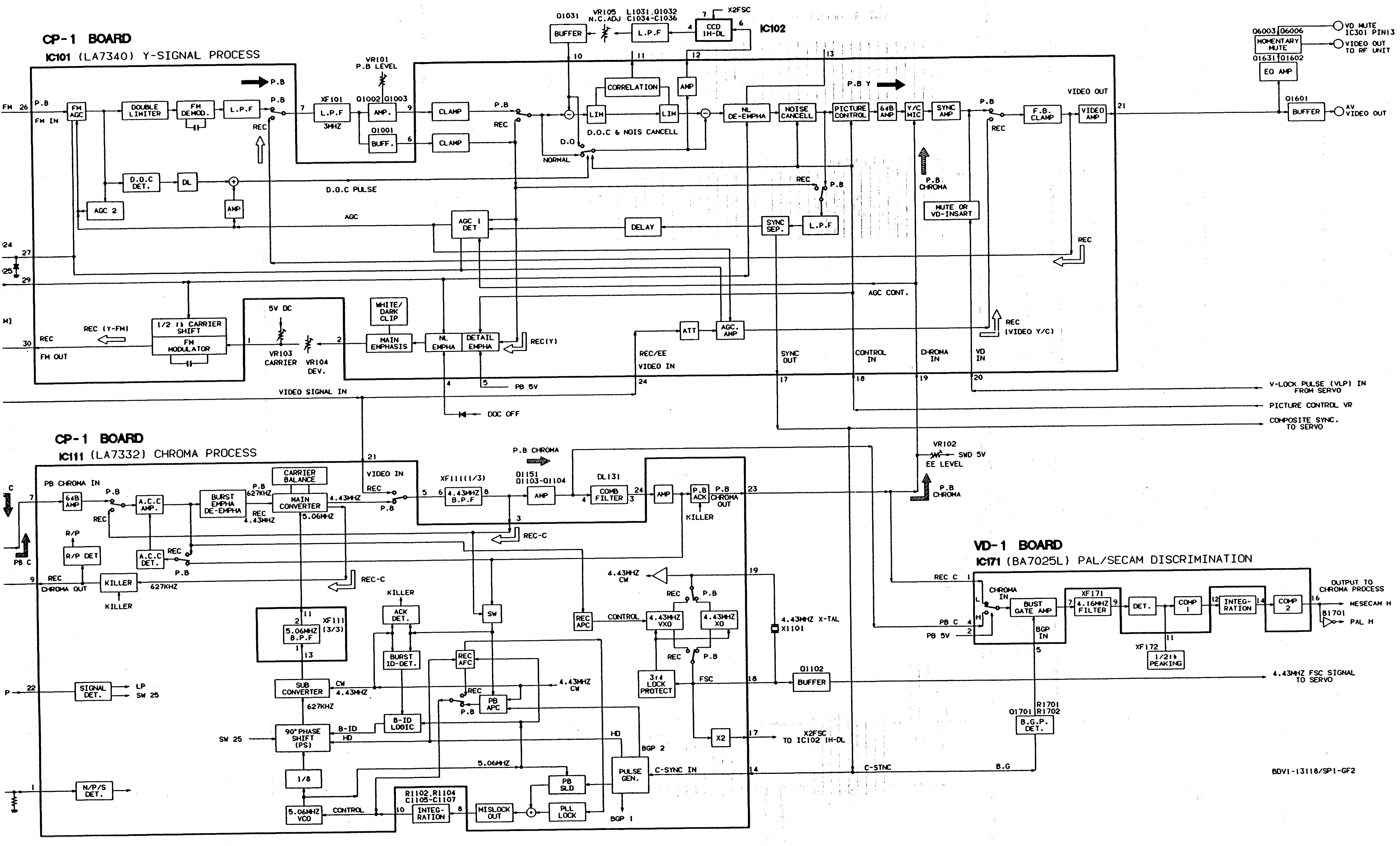
8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23

VIDEO CIRCUIT BASIC BLOCK DIAGRAM



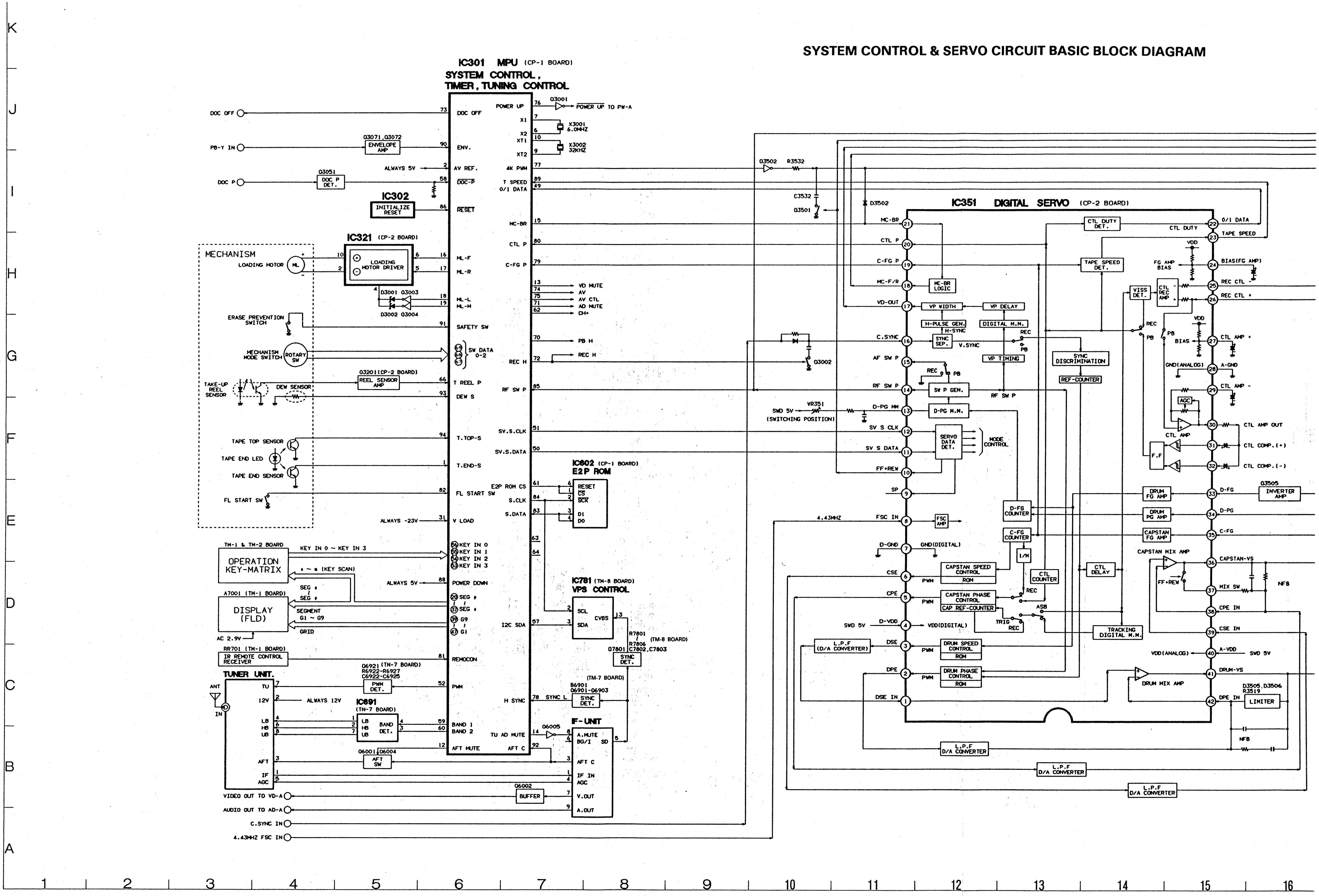
HEAD DRUM
CH1
V-HEAD
CH2
R.T
PRE AMP UNIT.
IC181 (LA7320) REC/PRE.AMP
AMP
SW REC ON
RF SW P
ENV.OUT
PB
REC
CURRENT AMP
Y/C MIX AMP
PB ON
RF SWITCHING PULSE
TP183
RF SW P
REC CURRENT CHECK
TP181
ENV.
TP182
RF. 3 ENVELOPE OUT
PB 5V
REC 12V
VR182
FILTER
REC-Y
VR181
REC.C
TO SYSCON FOR ATR
PB Y
Q1051
BUFFER
PB Y-FM
Q1851-Q1854
EQ AMP
PB H
DOC OFF
Q1004
C1024
C1025
RF SW P.
[REC Y-FM]
TP103
CP-1 BOARD
IC101 (LA7340) Y-SIGNAL PROCESS
P.B
FM IN
FM AGC
DOUBLE LIMITER
FM DEMOD.
L.P.F
REC
XF101
L.P.F
3MHZ
VR101
P.B LEVEL
Q1002 Q1003
AMP.
Q1001
BUFF.
CLAMP
D.O.C DET.
DL
AGC 2
AMP
D.O.C PULSE
AGC
AGC 1 DET
1/2 H CARRIER SHIFT
FM MODULATOR
REC (Y-FM)
FM OUT
5V DC
VR103
CARRIER
VR104
DEV.
WHITE/ DARK CLIP
MAIN EMPHASIS
NL EMPHA
DETAIL EMPHA
REC(Y)
PB 5V
DOC OFF
VIDEO SIGNAL IN
Q1031
BUFFER
VR105
N.C.ADJ
L1031,Q1032
C1034-C1036
L.P.F
CCD 1H-DL
X2FSC
IC102
CORRELATION
AMP
LIM
D.O.C & NOIS CANCELL
D.O
NORMAL
NL DE-EMPHA
NOISE CANCELL
PICTURE CONTROL
P.B Y
DELAY
SYNC SEP.
L.P.F
ATT
AGC. AMP
REC/EE VIDEO IN
SYNC OUT
CONTROL IN
TB-1 BOARD
IC861 (LA7221) INPUT SELECT
TUNER VIDEO IN
AV VIDEO IN
MUTE
INPUT VIDEO SIG.
Q8601
Q8602
AV (IC301 Pin74)
PB 5V
L1104,L1105
C1124,C1125
C1281
L.P.F
BUFFER
Q1105,Q1106
PB C
Q1201
SYSTEM SW
C1201
PAL H
Q1101
BUFFER
XF111(2/3)
1.4MHZ L.P.F
REC C
CP-1 BOARD
IC111 (LA7332) CHROMA PROCESS
PB CHROMA IN
64B AMP
A.C.C AMP.
BURST EMPHA DE-EMPHA
627KHZ
CARRIER BALANCE
MAIN CONVERTER
4.43MHZ
5.06MHZ
R/P
R/P DET
A.C.C DET.
REC CHROMA OUT
KILLER
VIDEO IN
XF111(1/3)
4.43MHZ B.P.F
Q1151
Q1103-Q1104
AMP
P.B CHROMA
DL131
COMB FILTER
P.B ACK
P.B CHROMA OUT
REC-C
5.06MHZ B.P.F
XF111 (3/3)
ACK DET.
SW
REC APC
CONTROL
4.43MHZ VXO
4.43MHZ XO
4.43MHZ CW
4.43MHZ X-TAL
X1101
BURST ID-DET.
REC AFC
3:4 LOCK PROTECT
FSC
Q1102
BUFFER
RF SW P
SIGNAL DET.
LP
SW 25
SUB CONVERTER
CW
PB APC
B-ID LOGIC
SW 25
90° PHASE SHIFT (PS)
B-ID
HD
X2
X2FSC TO IC102 1H-DL
1/8
5.06MHZ
PULSE GEN.
BGP 2
C-SYNC IN
C-SYNC
MESECAM H
N/P/S DET.
5.06MHZ VCO
R1102,R1104
C1105-C1107
INTEG-RATION
MISLOCK OUT
PB SLD
PLL LOCK
BGP 1
K J I H G F E D C B A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

VIDEO CIRCUIT BASIC BLOCK DIAGRAM



CP-1 BOARD
IC101 (LA7340) Y-SIGNAL PROCESS
FM 26 P.B
FM IN
FM AGC
DOUBLE LIMITER
FM DEMOD.
L.P.F
P.B
REC
XF101 L.P.F 3MHZ
VR101 P.B LEVEL
Q1002 Q1003 AMP.
Q1001 BUFF.
CLAMP
CLAMP
Q1031 BUFFER
VR105 N.C.ADJ
L1031,Q1032 C1034-C1036 L.P.F
CCD 1H-DL
X2FSC
IC102
CORRELATION
AMP
LIM
LIM
D.O.C & NOIS CANCELL
D.O
NORMAL
NL DE-EMPHA
NOISE CANCELL
PICTURE CONTROL
6dB AMP
Y/C MIC
SYNC AMP
P.B Y
VIDEO OUT
F.B. CLAMP
VIDEO AMP
21
D.O.C DET.
DL
D.O.C PULSE
AGC 2
AMP
AGC
AGC 1 DET
DELAY
SYNC SEP.
L.P.F
REC P.B
P.B CHROMA
MUTE OR VD-INSART
REC
AGC CONT.
1/2 (!) CARRIER SHIFT
FM MODULATOR
REC (Y-FM)
REC
FM OUT
5V DC
VR103 CARRIER
VR104 DEV.
WHITE/DARK CLIP
MAIN EMPHASIS
NL EMPHA
DETAIL EMPHA
REC(Y)
ATT
AGC. AMP
REC/EE VIDEO IN
SYNC OUT
CONTROL IN
CHROMA IN
VD IN
REC (VIDEO Y/C)
PB 5V
DOC OFF
VIDEO SIGNAL IN
V-LOCK PULSE (VLP) IN FROM SERVO
PICTURE CONTROL VR
COMPOSITE SYNC. TO SERVO
Q6003,Q6006 MOMENTARY MUTE
VD MUTE IC301 PIN13
VIDEO OUT TO RF UNIT
Q1631,Q1602 EQ AMP
Q1601 BUFFER
AV VIDEO OUT
CP-1 BOARD
IC111 (LA7332) CHROMA PROCESS
PB CHROMA IN
6dB AMP
A.C.C AMP.
P.B 627KHZ
BURST EMPHA DE-EMPHA
CARRIER BALANCE
MAIN CONVERTER
4.43MHZ
5.06MHZ
VIDEO IN
XF111(1/3) 4.43MHZ B.P.F
Q1151 Q1103-Q1104 AMP
DL131 COMB FILTER
AMP
P.B ACK
P.B CHROMA OUT
KILLER
P.B CHROMA
VR102 SWD 5V
EE LEVEL
REC-C
R/P
R/P DET
A.C.C DET.
REC CHROMA OUT
KILLER 627KHZ
PB C
KILLER
ACK DET.
SW
REC APC
CONTROL
4.43MHZ VXO
4.43MHZ XO
4.43MHZ CW
4.43MHZ X-TAL X1101
XF111 (3/3) 5.06MHZ B.P.F
BURST ID-DET.
REC AFC
PB APC
SIGNAL DET.
LP SW 25
SUB CONVERTER
CW 4.43MHZ
627KHZ
4.43MHZ CW
3:4 LOCK PROTECT
FSC
Q1102 BUFFER
4.43MHZ FSC SIGNAL TO SERVO
90° PHASE SHIFT (PS)
SW 25
B-ID HD
B-ID LOGIC
HD
BGP 2
X2
X2FSC TO IC102 1H-DL
1/8
5.06MHZ
PULSE GEN.
C-SYNC IN
C-SYNC
B.G
N/P/S DET.
5.06MHZ VCO
CONTROL
R1102,R1104 C1105-C1107 INTEG-RATION
MISLOCK OUT
PB SLD
PLL LOCK
BGP 1
VD-1 BOARD
IC171 (BA7025L) PAL/SECAM DISCRIMINATION
REC C
PB C
PB 5V
CHROMA IN
BUST GATE AMP
BGP IN
XF171 4.16MHZ FILTER
DET.
COMP 1
INTEG-RATION
COMP 2
XF172 1/2(!) PEAKING
OUTPUT TO CHROMA PROCESS
MESECAM H
D1701
PAL H
Q1701 R1701 R1702 B.G.P. DET.
BDV1-13118/SP1-GF2

SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM


IC301 MPU (CP-1 BOARD)
SYSTEM CONTROL, TIMER, TUNING CONTROL
DOC OFF
PB-Y IN
DOC P
Q3071,Q3072
ENVELOPE AMP
ENV.
ALWAYS 5V
AV REF.
Q3051
DOC P DET.
DOC-P
IC302
INITIALIZE RESET
RESET
IC321 (CP-2 BOARD)
MECHANISM
LOADING MOTOR
ML
LOADING MOTOR DRIVER
ML-F
ML-R
D3001 D3003
D3002 D3004
ML-L
ML-H
ERASE PREVENTION SWITCH
SAFETY SW
MECHANISM MODE SWITCH
ROTARY SW
SW DATA 0-2
Q3201(CP-2 BOARD)
REEL SENSOR AMP
TAKE-UP REEL SENSOR
DEW SENSOR
T REEL P
DEW S
TAPE TOP SENSOR
TAPE END LED
TAPE END SENSOR
T.TOP-S
T.END-S
FL START SW
ALWAYS -23V
V LOAD
TM-1 & TM-2 BOARD
OPERATION KEY-MATRIX
KEY IN 0 ~ KEY IN 3
(KEY SCAN)
KEY IN 0
KEY IN 1
KEY IN 2
KEY IN 3
ALWAYS 5V
POWER DOWN
A7001 (TM-1 BOARD)
DISPLAY (FLD)
SEG
SEGMENT
G1 ~ G9
GRID
AC 2.9V
G9
G1
RR701 (TM-1 BOARD)
IR REMOTE CONTROL RECEIVER
REMOCON
TUNER UNIT.
ANT
IN
TU
12V
ALWAYS 12V
Q6921 (TN-7 BOARD)
R6922-R6927
C6922-C6925
PWM DET.
PWM
IC691 (TN-7 BOARD)
LB
HB
UB
BAND DET.
BAND 1
BAND 2
AFT
Q6001,Q6004
AFT SW
AFT MUTE
IF
AGC
VIDEO OUT TO VD-A
AUDIO OUT TO AD-A
C.SYNC IN
4.43MHZ FSC IN
Q6002
BUFFER
POWER UP
Q3001
POWER UP TO PW-A
X1
X2
XT1
XT2
X3001 6.0MHZ
X3002 32KHZ
4K PWM
T SPEED
0/1 DATA
MC-BR
CTL P
C-FG P
VD MUTE
AV
AV CTL
AD MUTE
CH+
PB H
REC H
RF SW P
SV.S.CLK
SV.S.DATA
IC602 (CP-1 BOARD)
E2P ROM
E2P ROM CS
S.CLK
S.DATA
RESET
CS
SCK
DI
DO
IC781 (TH-8 BOARD)
VPS CONTROL
SCL
SDA
CVBS
I2C SDA
R7801
R7806
Q7801
C7802,C7803
(TM-8 BOARD)
SYNC DET.
(TM-7 BOARD)
B6901
Q6901-Q6903
H SYNC
SYNC L
Q6005
IF-UNIT
A.MUTE
BG/I
SD
TU AD MUTE
AFT C
IF IN
V.OUT
A.OUT
Q3502
R3532
C3532
Q3501
D3502
IC351 DIGITAL SERVO (CP-2 BOARD)
MC-BR
CTL P
C-FG P
MC-F/R
VD-OUT
C.SYNC
AF SW P
RF SW P
D-PG MM
SV S CLK
SV S DATA
FF+REW
SP
FSC IN
D-GND
CSE
CPE
D-VDD
DSE
DPE
DSE IN
Q3002
SWD 5V
VR351
(SWITCHING POSITION)
4.43MHZ
MC-BR LOGIC
VP WIDTH
VP DELAY
H-PULSE GEN.
H-SYNC
DIGITAL M.M.
SYNC SEP.
V.SYNC
REC
PB
VP TIMING
SW P GEN.
RF SW P
D-PG M.M.
SERVO DATA DET.
MODE CONTROL
FSC AMP
GND(DIGITAL)
D-FG COUNTER
C-FG COUNTER
1/N
CAPSTAN SPEED CONTROL
ROM
CAPSTAN PHASE CONTROL
CAP REF-COUNTER
CTL COUNTER
ASB
TRIG
VDD(DIGITAL)
DRUM SPEED CONTROL
DRUM PHASE CONTROL
L.P.F (D/A CONVERTER)
L.P.F D/A CONVERTER
CTL DUTY DET.
CTL DUTY
TAPE SPEED DET.
SYNC DISCRIMINATION
REF-COUNTER
CTL DELAY
TRACKING DIGITAL M.M.
VDD
FG AMP BIAS
VISS DET.
CTL REC AMP
BIAS
GND(ANALOG)
AGC
CTL AMP
F.F
DRUM FG AMP
DRUM PG AMP
CAPSTAN FG AMP
CAPSTAN MIX AMP
FF+REW
VDD(ANALOG)
DRUM MIX AMP
0/1 DATA
TAPE SPEED
BIAS(FG AMP)
REC CTL -
REC CTL +
CTL AMP +
A-GND
CTL AMP -
CTL AMP OUT
CTL COMP.(+)
CTL COMP.(-)
D-FG
D-PG
C-FG
CAPSTAN-VS
MIX SW
CPE IN
CSE IN
A-VDD
SWD 5V
DRUM-VS
DPE IN
Q3505
INVERTER AMP
D3505,D3506
R3519
LIMITER
NFB
K
J
I
H
G
F
E
D
C
B
A
1
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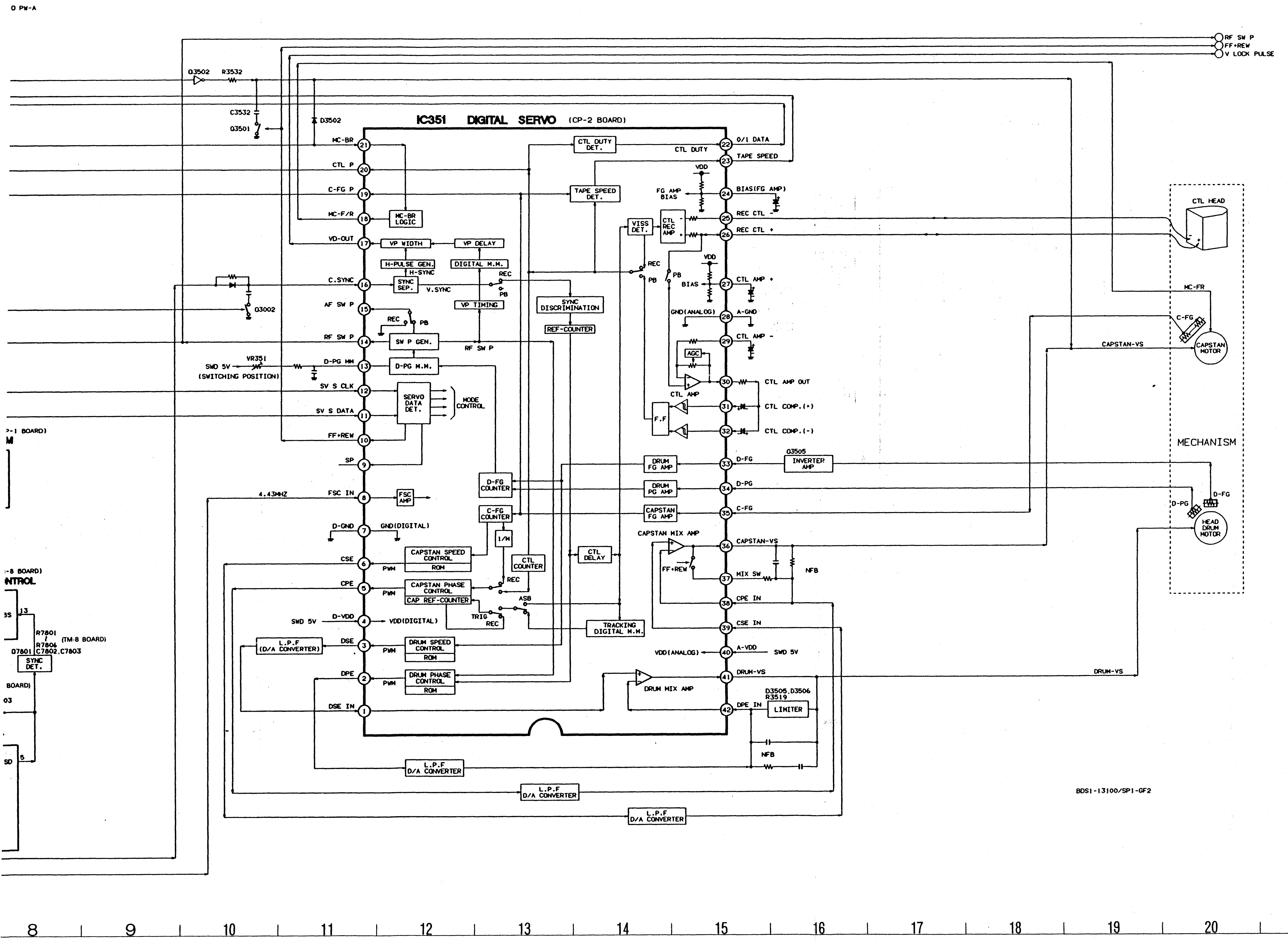
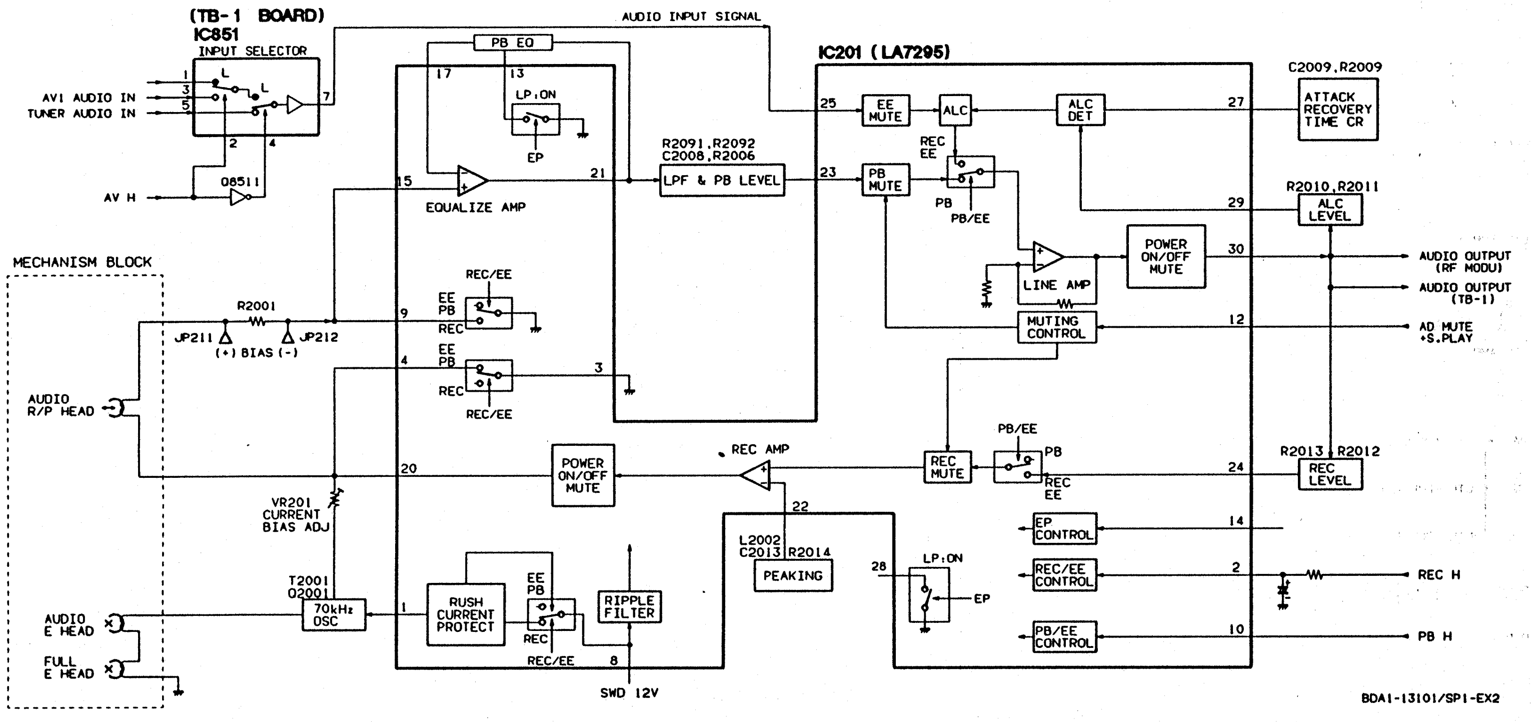
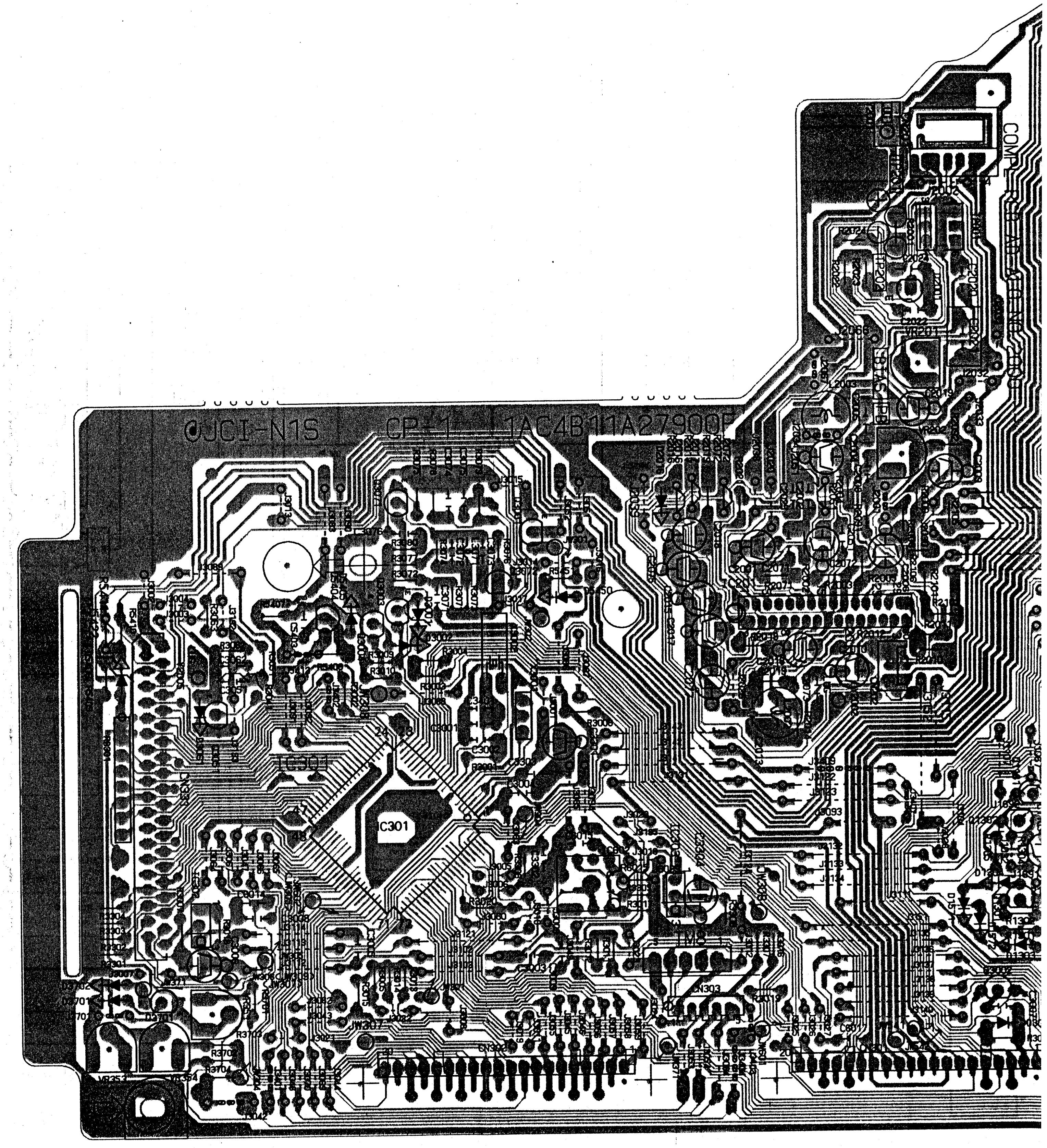
SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM

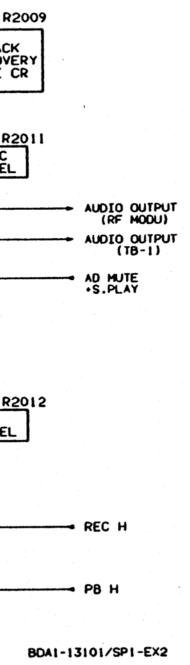

O PW-A
RF SW P
FF+REW
V LOCK PULSE
Q3502
R3532
C3532
Q3501
D3502
IC351 DIGITAL SERVO (CP-2 BOARD)
MC-BR
CTL P
C-FG P
MC-F/R
VD-OUT
C.SYNC
AF SW P
RF SW P
D-PG MM
SV S CLK
SV S DATA
FF+REW
SP
FSC IN
D-GND
CSE
CPE
D-VDD
DSE
DPE
DSE IN
Q3002
VR351
SWD 5V
(SWITCHING POSITION)
4.43MHZ
MC-BR LOGIC
VP WIDTH
VP DELAY
H-PULSE GEN.
DIGITAL M.M.
H-SYNC
SYNC SEP.
V.SYNC
REC
PB
VP TIMING
SW P GEN.
RF SW P
D-PG M.M.
SERVO DATA DET.
MODE CONTROL
FSC AMP
GND(DIGITAL)
CAPSTAN SPEED CONTROL
ROM
PWM
CAPSTAN PHASE CONTROL
CAP REF-COUNTER
VDD(DIGITAL)
TRIG
ASB
DRUM SPEED CONTROL
DRUM PHASE CONTROL
L.P.F (D/A CONVERTER)
CTL DUTY DET.
CTL DUTY
TAPE SPEED DET.
SYNC DISCRIMINATION
REF-COUNTER
D-FG COUNTER
C-FG COUNTER
1/N
CTL COUNTER
CTL DELAY
TRACKING DIGITAL M.M.
VISS DET.
CTL REC AMP
FG AMP BIAS
VDD
BIAS
GND(ANALOG)
AGC
CTL AMP
F.F
DRUM FG AMP
DRUM PG AMP
CAPSTAN FG AMP
CAPSTAN MIX AMP
FF+REW
VDD(ANALOG)
DRUM MIX AMP
0/1 DATA
TAPE SPEED
BIAS(FG AMP)
REC CTL -
REC CTL +
CTL AMP +
A-GND
CTL AMP -
CTL AMP OUT
CTL COMP.(+)
CTL COMP.(-)
D-FG
D-PG
C-FG
CAPSTAN-VS
MIX SW
NFB
CPE IN
CSE IN
A-VDD
SWD 5V
DRUM-VS
DPE IN
Q3505
INVERTER AMP
D3505,D3506
R3519
LIMITER
NFB
L.P.F D/A CONVERTER
CTL HEAD
MC-FR
C-FG
CAPSTAN MOTOR
CAPSTAN-VS
MECHANISM
D-FG
D-PG
HEAD DRUM MOTOR
DRUM-VS
>-1 BOARD)
-8 BOARD)
NTROL
J3
R7801
R7806
(TM-8 BOARD)
D7801
C7802,C7803
SYNC DET.
BOARD)
03
SD
5
BDS1-13100/SP1-GF2
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

AUDIO CIRCUIT BASIC BLOCK DIAGRAM

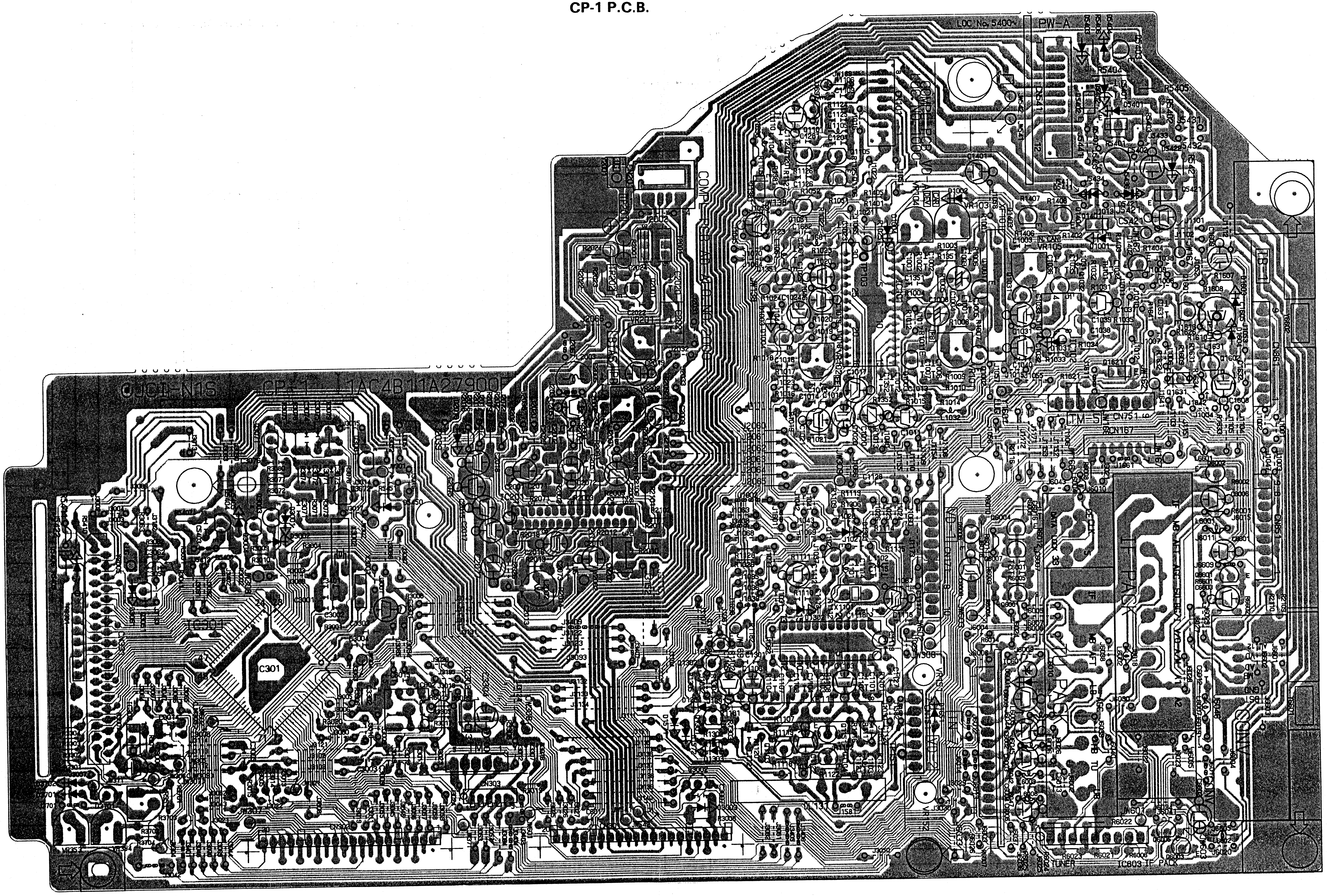

(TB-1 BOARD)
IC851
INPUT SELECTOR
AV1 AUDIO IN
TUNER AUDIO IN
AV H
Q8511
AUDIO INPUT SIGNAL
PB EQ
LP:ON
EP
EQUALIZE AMP
R2091,R2092
C2008,R2006
LPF & PB LEVEL
IC201 (LA7295)
EE MUTE
ALC
ALC DET
C2009,R2009
ATTACK RECOVERY TIME CR
REC EE
PB MUTE
PB
PB/EE
R2010,R2011
ALC LEVEL
LINE AMP
POWER ON/OFF MUTE
AUDIO OUTPUT (RF MODU)
AUDIO OUTPUT (TB-1)
MUTING CONTROL
AD MUTE +S.PLAY
MECHANISM BLOCK
R2001
JP211
JP212
(+) BIAS (-)
REC/EE
EE PB REC
AUDIO R/P HEAD
REC AMP
REC MUTE
R2013
R2012
REC LEVEL
VR201 CURRENT BIAS ADJ
L2002
C2013
R2014
PEAKING
EP CONTROL
REC/EE CONTROL
PB/EE CONTROL
REC H
PB H
T2001
Q2001
70kHz OSC
RUSH CURRENT PROTECT
RIPPLE FILTER
AUDIO E HEAD
FULL E HEAD
SWD 12V
BDA1-13101/SP1-EX2

CP-1 P.C.B.


JCI-N1S
CP-1
IC301

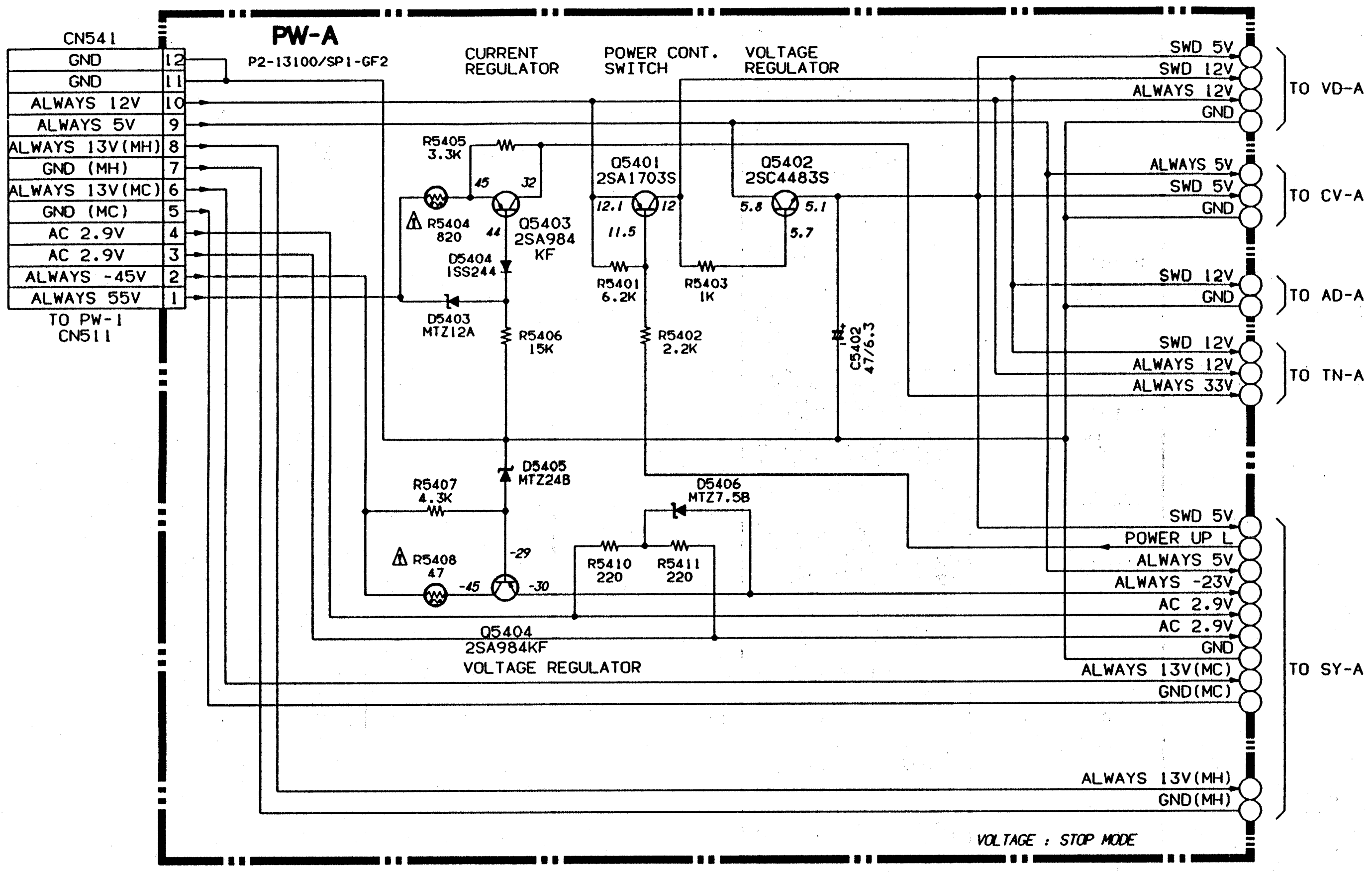

R2009
R2011
AUDIO OUTPUT (RF MODU)
AUDIO OUTPUT (TB-1)
AD MUTE +S.PLAY
R2012
REC H
PB H
BDA1-13101/SP1-EX2

CP-1 P.C.B.

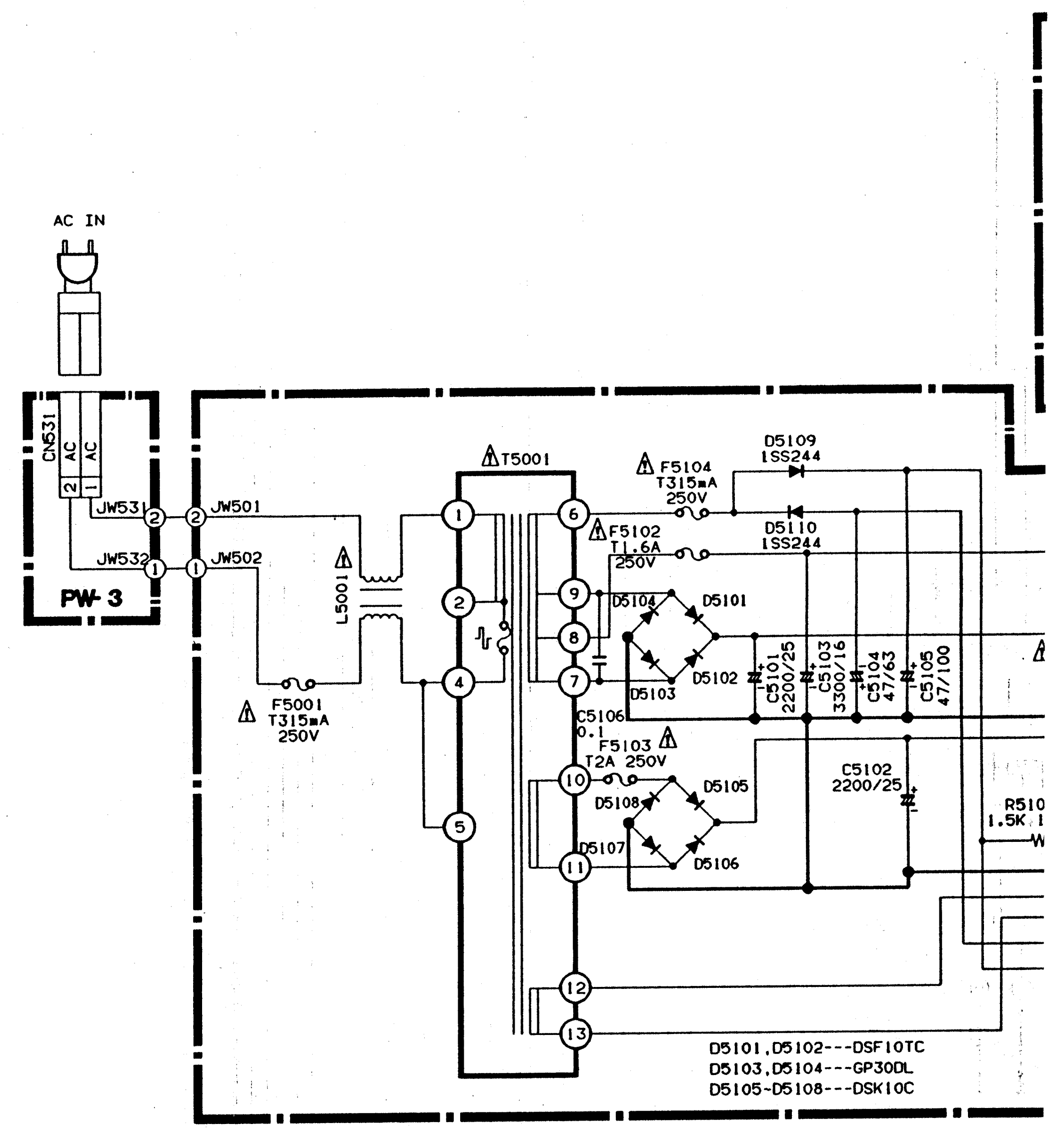

LOC No. 5400
PW-A
CJC1-N1S
CP-1
1AC4B11A27900
COMP
IC301
C301
TB-1
TM-5
CN751
CN167
IF PACK
TUNER
IC803 IF PACK
VR201
VR103
VR105
JW601

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

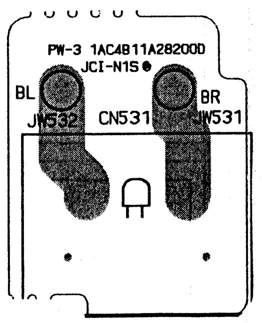
CP-1 BOARD (PW-A) POWER SUPPLY CIRCUIT DIAGRAM


CN541
GND 12
GND 11
ALWAYS 12V 10
ALWAYS 5V 9
ALWAYS 13V(MH) 8
GND (MH) 7
ALWAYS 13V(MC) 6
GND (MC) 5
AC 2.9V 4
AC 2.9V 3
ALWAYS -45V 2
ALWAYS 55V 1
TO PW-1 CN511
PW-A
P2-13100/SP1-GF2
CURRENT REGULATOR
POWER CONT. SWITCH
VOLTAGE REGULATOR
R5405 3.3K
R5404 820
D5404 1SS244
D5403 MTZ12A
Q5403 2SA984 KF
Q5401 2SA1703S
Q5402 2SC4483S
R5401 6.2K
R5403 1K
R5406 15K
R5402 2.2K
C5402 47/6.3
D5405 MTZ24B
D5406 MTZ7.5B
R5407 4.3K
R5408 47
R5410 220
R5411 220
Q5404 2SA984KF VOLTAGE REGULATOR
SWD 5V
SWD 12V
ALWAYS 12V
GND
TO VD-A
ALWAYS 5V
SWD 5V
GND
TO CV-A
SWD 12V
GND
TO AD-A
SWD 12V
ALWAYS 12V
ALWAYS 33V
TO TN-A
SWD 5V
POWER UP L
ALWAYS 5V
ALWAYS -23V
AC 2.9V
AC 2.9V
GND
ALWAYS 13V(MC)
GND(MC)
TO SY-A
ALWAYS 13V(MH)
GND(MH)
VOLTAGE : STOP MODE

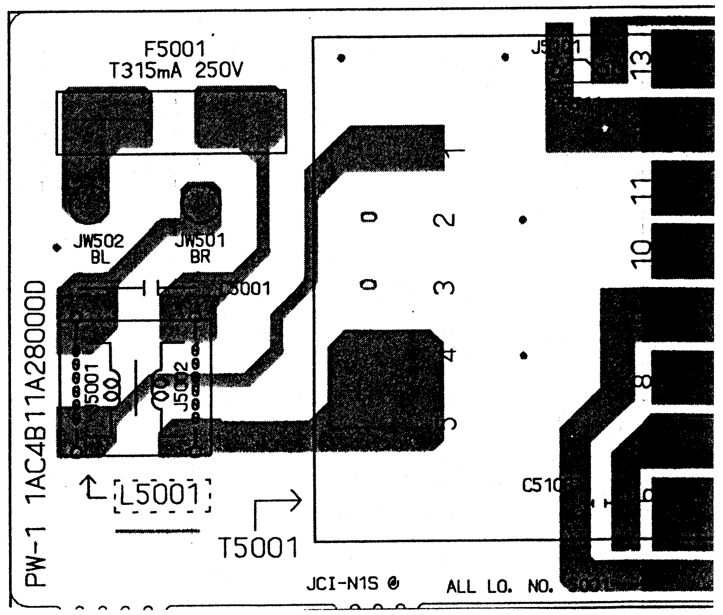
PW-1,2,3 BOARD POWER SUPP

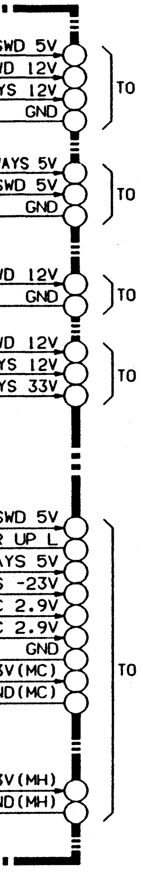

AC IN
CN531
AC
AC
JW531
JW532
PW-3
JW501
JW502
L5001
F5001 T315mA 250V
T5001
F5104 T315mA 250V
F5102 T1.6A 250V
F5103 T2A 250V
D5109 1SS244
D5110 1SS244
D5101
D5102
D5103
D5104
D5105
D5106
D5107
D5108
C5101 2200/25
C5102 2200/25
C5103 330/16
C5104 47/63
C5105 47/100
C5106 0.1
R510 1.5K
D5101,D5102---DSF10TC
D5103,D5104---GP30DL
D5105~D5108---DSK10C

PW-3 P.C.B.


PW-3 1AC4B11A28200D
JCI-N1S
BL
BR
JW532
CN531
JW531

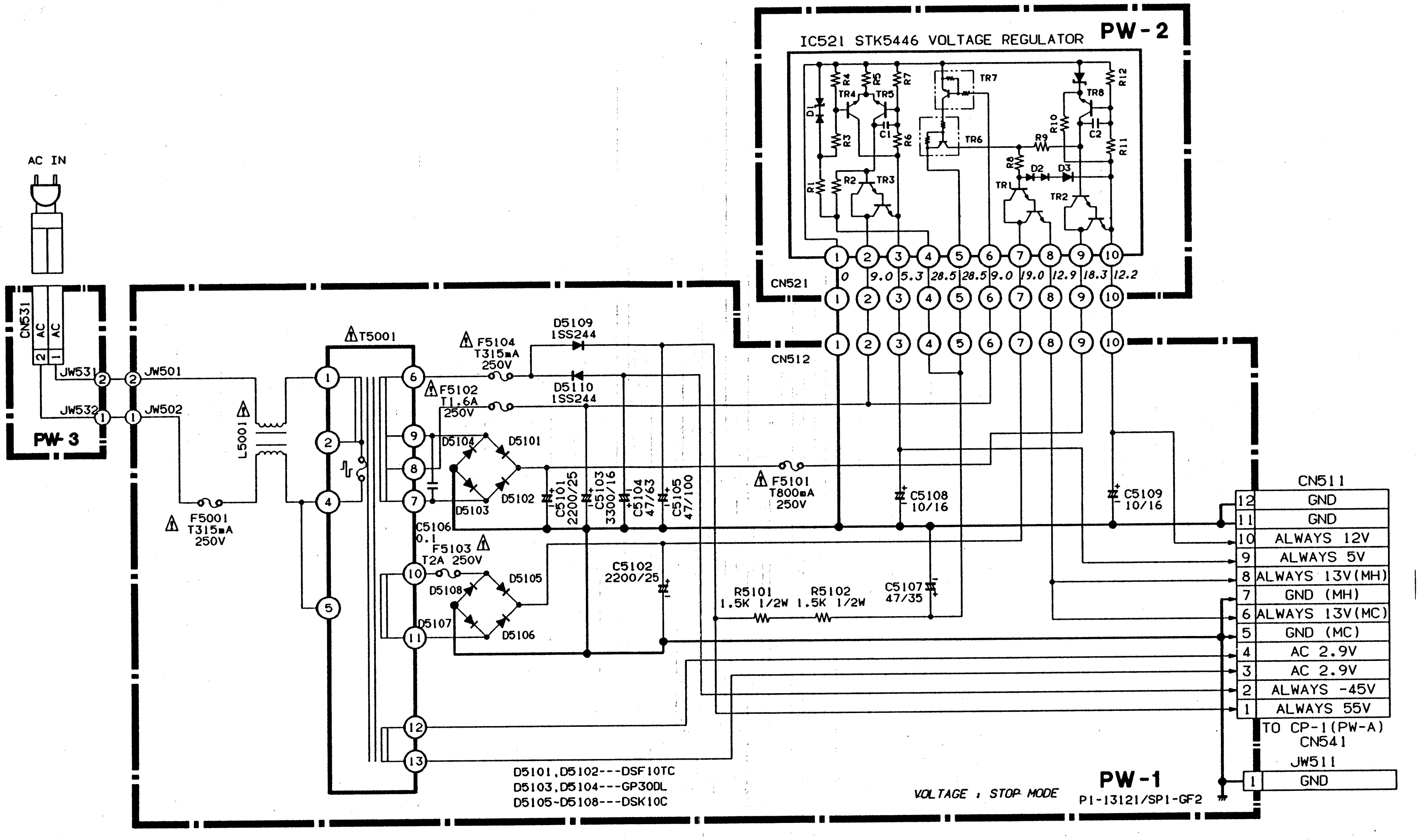
PV


F5001
T315mA 250V
JW502 BL
JW501 BR
L5001
T5001
PW-1 1AC4B11A28000D
JCI-N1S
ALL LO. NO.



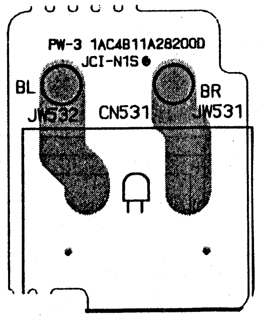
SWD 5V
VD 12V
YS 12V
GND
TO VD-A
AYS 5V
SWD 5V
GND
TO CV-A
VD 12V
GND
TO AD-A
VD 12V
YS 12V
YS 33V
TO TN-A
SWD 5V
UP L
AYS 5V
S -23V
C 2.9V
C 2.9V
GND
5V(MC)
ND(MC)
TO SY-A
5V(MH)
ND(MH)

PW-1,2,3 BOARD POWER SUPPLY CIRCUIT DIAGRAM



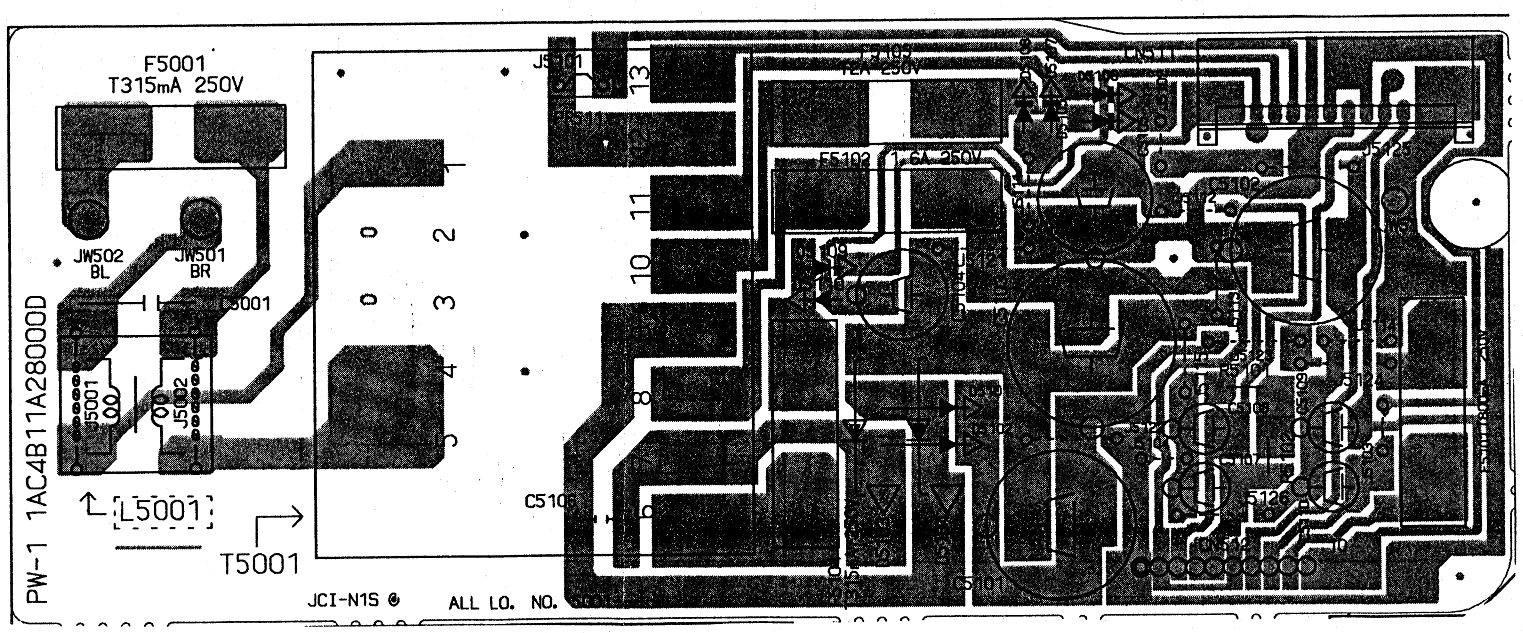
IC521 STK5446 VOLTAGE REGULATOR
PW-2
R4
R5
R7
TR7
R12
TR4
TR5
TR8
D1
C1
R6
TR6
R10
R3
R9
C2
R11
R8
D2
D3
R1
R2
TR3
TR1
TR2
CN521
0
9.0
5.3
28.5
28.5
9.0
19.0
12.9
18.3
12.2
CN512
AC IN
CN531
AC
AC
JW531
JW532
PW-3
JW501
JW502
L5001
F5001
T315mA
250V
T5001
F5104
T315mA
250V
D5109
1SS244
F5102
T1.6A
250V
D5110
1SS244
D5104
D5101
D5103
D5102
C5101
2200/25
C5103
3300/16
C5104
47/63
C5105
47/100
C5106
0.1
F5103
T2A 250V
D5108
D5105
D5107
D5106
C5102
2200/25
F5101
T800mA
250V
C5108
10/16
C5109
10/16
R5101
1.5K 1/2W
R5102
1.5K 1/2W
C5107
47/35
CN511
12 GND
11 GND
10 ALWAYS 12V
9 ALWAYS 5V
8 ALWAYS 13V(MH)
7 GND (MH)
6 ALWAYS 13V(MC)
5 GND (MC)
4 AC 2.9V
3 AC 2.9V
2 ALWAYS -45V
1 ALWAYS 55V
TO CP-1(PW-A)
CN541
JW511
1 GND
D5101,D5102---DSF10TC
D5103,D5104---GP300L
D5105-D5108---DSK10C
VOLTAGE : STOP MODE
PW-1
P1-13121/SP1-GF2

PW-3 P.C.B.



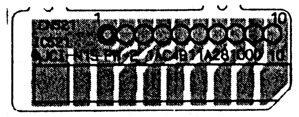
PW-3 1AC4B11A28200D
JCI-N1S
BL
BR
JW532
CN531
JW531

PW-1 P.C.B.

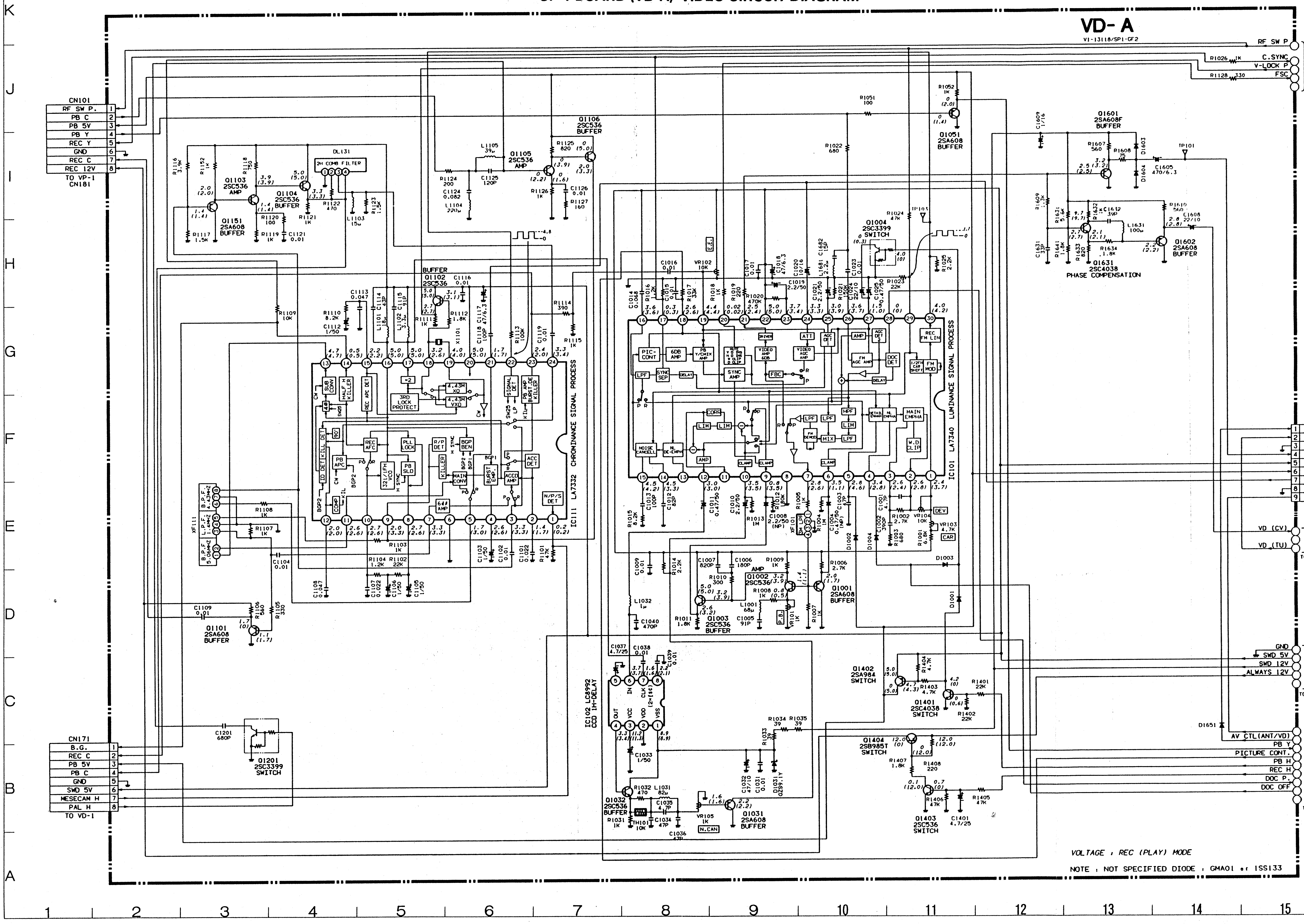


F5001
T315mA 250V
JW502
BL
JW501
BR
F5001
L5001
J5001
J5002
L5001
T5001
PW-1 1AC4B11A28000D
JCI-N1S
ALL LO. NO.
F5102 1.6A 250V
F5109
CN511
C5101

PW-2 P.C.B.



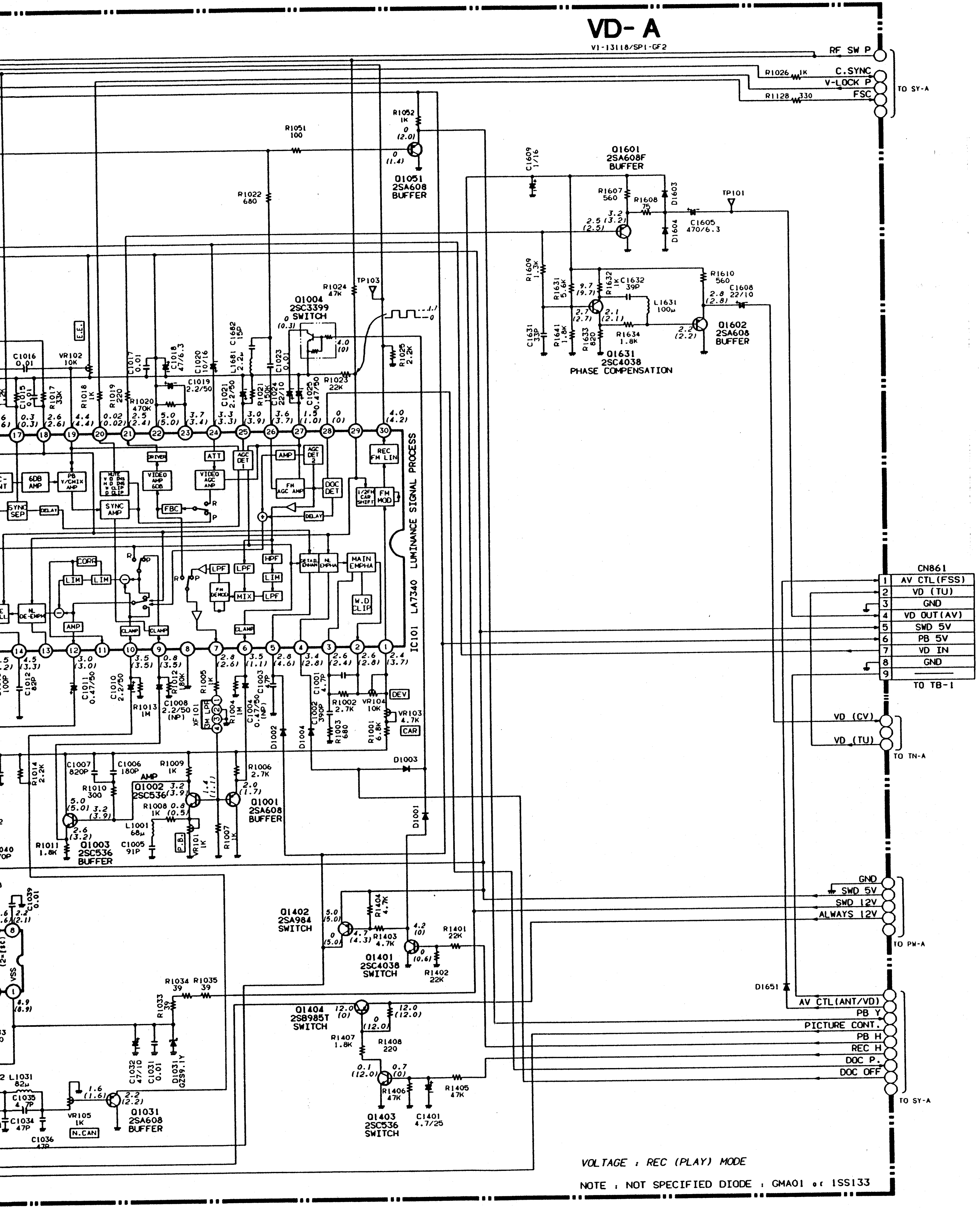
CP-1 BOARD (VD-A) VIDEO CIRCUIT DIAGRAM


K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
VD-A
VI-13118/SP1-GF2
CN101
RF SW P.
PB C
PB 5V
PB Y
REC Y
GND
REC C
REC 12V
TO VP-1 CN181
RF SW P
C.SYNC
V-LOCK P
FSC
TO SY-A
R1026 1K
R1128 330
Q1103 2SC536 AMP
Q1104 2SC536 BUFFER
Q1151 2SA608 BUFFER
DL131 2H COMB FILTER
Q1105 2SC536 AMP
Q1106 2SC536 BUFFER
Q1102 2SC536 BUFFER
Q1101 2SA608 BUFFER
XF111
B.P.F. 4.43MHz
L.P.F. 1.4MHz
B.P.F. 5.06MHz
IC111 LA7332 CHROMINANCE SIGNAL PROCESS
SUB CONV
HALF H KILLER
REC APC DET
3RD LOCK PROTECT
4.43M XO
4.43M VXO
SIGNAL DET
PB AMP BURST DE KILLER
REC AFC
PLL LOCK
R/P DET
BGP BEN
PB APC
PB SLD
KILLER
MAIN CONV
BURST EMP
ACC DET
ACC AMP
N/P/S DET
64# AMP
ID DET
KILL DET
COMP
IC101 LA7340 LUMINANCE SIGNAL PROCESS
PIC-CONT
6DB AMP
PB Y/CHIX AMP
VIDEO AGC AMP
ATT
AGC DET
AMP
REC FM LIN
SYNC SEP
SYNC AMP
FBC
FM AGC AMP
DOC DET
FM MOD
NOISE CANCELL
NL DE-EMPH
LIM
HPF
LPF
MIX
MAIN EMPHA
W.D CLIP
CLAMP
DELAY
DEV
CAR
Q1004 2SC3399 SWITCH
Q1051 2SA608 BUFFER
Q1601 2SA608F BUFFER
Q1602 2SA608 BUFFER
Q1631 2SC4038 PHASE COMPENSATION
TP101
TP103
Q1002 2SC536 AMP
Q1001 2SA608 BUFFER
Q1003 2SC536 BUFFER
IC102 LC8992 CCD 1H-DELAY
Q1032 2SC536 BUFFER
Q1031 2SA608 BUFFER
VR105 1K N.CAN
Q1201 2SC3399 SWITCH
CN171
B.G.
REC C
PB 5V
PB C
GND
SWD 5V
MESECAM H
PAL H
TO VD-1
Q1402 2SA984 SWITCH
Q1401 2SC4038 SWITCH
Q1404 2SB985T SWITCH
Q1403 2SC536 SWITCH
D1651
CN861
AV CTL(FSS)
VD (TU)
GND
VD OUT(AV)
SWD 5V
PB 5V
VD IN
GND
TO TB-1
VD (CV)
VD (TU)
TO TN-A
GND
SWD 5V
SWD 12V
ALWAYS 12V
TO PW-A
AV CTL(ANT/VD)
PB Y
PICTURE CONT.
PB H
REC H
DOC P.
DOC OFF
TO SY-A

VOLTAGE : REC (PLAY) MODE

NOTE : NOT SPECIFIED DIODE : GMA01 or 1SS133

-A) VIDEO CIRCUIT DIAGRAM

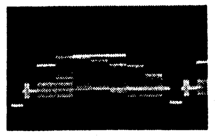
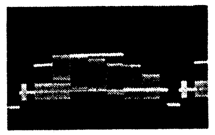
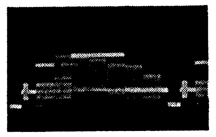
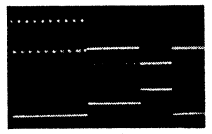
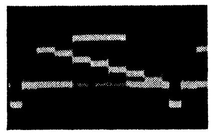
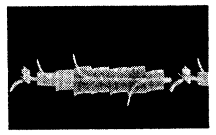
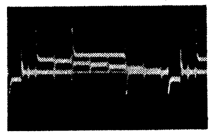
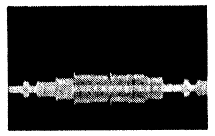
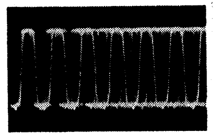
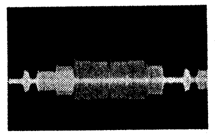
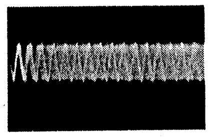
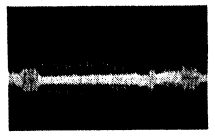
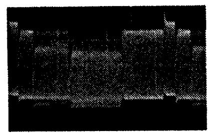
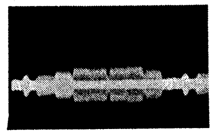
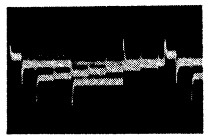
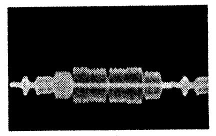
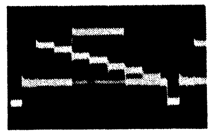
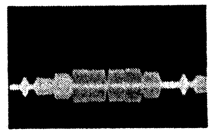
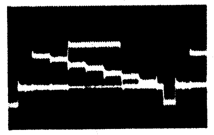
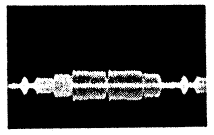
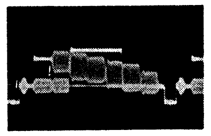
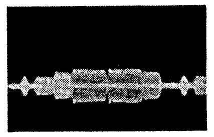

VD- A
VI-13118/SP1-GF2
RF SW P
C.SYNC
V-LOCK P
FSC
TO SY-A
R1026 1K
R1128 330
R1051 100
R1052 1K
Q1051 2SA608 BUFFER
R1022 680
Q1601 2SA608F BUFFER
R1607 560
R1608 75
D1603
D1604
C1605 470/6.3
TP101
C1609 1/16
R1609 1.3K
R1631 5.6K
R1632 1K
C1632 39P
L1631 100μ
R1610 560
C1608 22/10
Q1602 2SA608 BUFFER
C1631 33P
R1641 1.8K
R1633 820
R1634 1.8K
Q1631 2SC4038 PHASE COMPENSATION
Q1004 2SC3399 SWITCH
R1024 47K
TP103
R1025 2.2K
R1023 22K
C1016 0.01
VR102 10K
R1017 33K
R1018 1K
R1019 220
R1020 470K
C1019 2.2/50
C1682 15P
SYNC SEP
DELAY
SYNC AMP
FBC
VIDEO AMP 6DB
VIDEO AGC AMP
ATT
AGC DET
AMP
AGC DET
FM AGC AMP
DOC DET
REC FM LIM
FM MOD
DELAY
CORR
LIM
LPF
MIX
HPF
MAIN EMPHA
W.D CLIP
DE-EMPH
AMP
CLAMP
LUMINANCE SIGNAL PROCESS
IC101 LA7340
CN861
1 AV CTL(FSS)
2 VD (TU)
3 GND
4 VD OUT(AV)
5 SWD 5V
6 PB 5V
7 VD IN
8 GND
9
TO TB-1
VD (CV)
VD (TU)
TO TN-A
R1001 6.8K
R1002 2.7K
R1003 680
VR104 10K
VR103 4.7K
DEV
CAR
D1001
D1002
D1003
D1004
C1007 820P
C1006 180P
R1009 1K
R1010 300
Q1002 2SC536 AMP
R1008 1K
R1006 2.7K
Q1001 2SA608 BUFFER
L1001 68μ
C1005 91P
Q1003 2SC536 BUFFER
R1011 1.8K
R1014 2.2K
R1007 1K
GND
SWD 5V
SWD 12V
ALWAYS 12V
TO PW-A
Q1402 2SA984 SWITCH
R1404 4.7K
R1403 4.7K
Q1401 2SC4038 SWITCH
R1401 22K
R1402 22K
D1651
AV CTL(ANT/VD)
PB Y
PICTURE CONT.
PB H
REC H
DOC P.
DOC OFF
TO SY-A
Q1404 2SB985T SWITCH
R1407 1.8K
R1408 220
R1406 47K
R1405 47K
Q1403 2SC536 SWITCH
C1401 4.7/25
R1034 39
R1035 39
R1033 39
C1032 47/10
C1031 0.01
D1031 GZS9.1Y
L1031 82μ
C1035 4.7P
C1034 47P
C1036 47P
VR105 1K
N.CAN
Q1031 2SA608 BUFFER

VOLTAGE : REC (PLAY) MODE

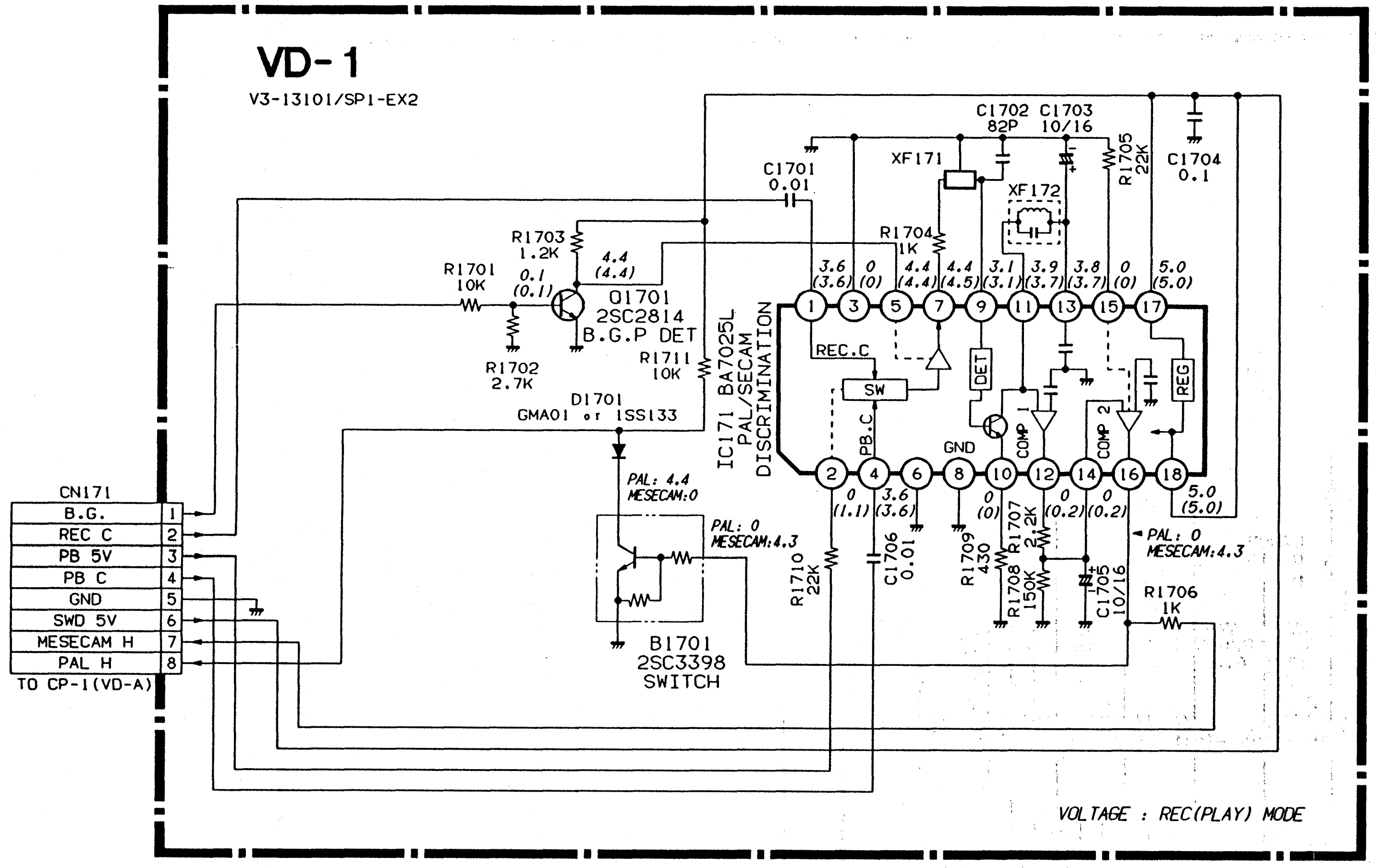
NOTE : NOT SPECIFIED DIODE : GMA01 or 1SS133

WAVEFORM OF VIDEO

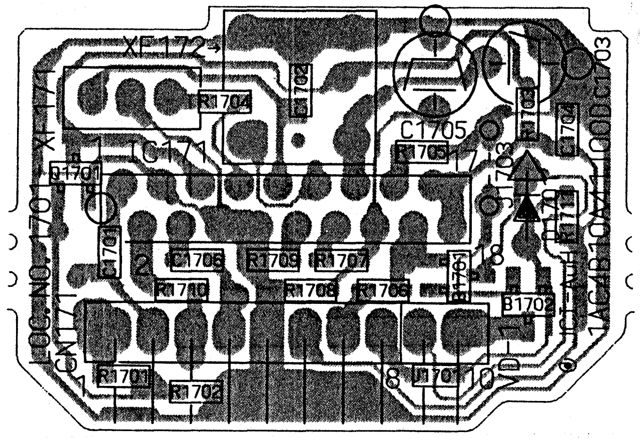
WF-V-SP

TEST LOCATION	WAVEFORM	MODE/LEVEL	TEST LOCATION	WAVEFORM	MODE/LEVEL
IC101 Pin 24		REC, EE 1 Vp-p	IC101 Pin 21		REC, EE 2 Vp-p
IC101 Pin 7		REC, EE 1 Vp-p	IC101 (UPPER) Pin 21 (LOWER) Pin 20		STILL (UPPER) 2 Vp-p (LOWER) 5 Vp-p
IC101 Pin 6		REC, EE 0.45 Vp-p	IC111 Pin 21		REC, EE 1 Vp-p
IC101 Pin 2		REC, EE 1.3 Vp-p	IC111 Pin 3		REC, EE 0.14 Vp-p
IC101 Pin 30		REC, EE 1.5 Vp-p	IC111 Pin 9		REC, EE 0.8Vp-p
IC101 Pin 26		PB 0.8 Vp-p	Q1105 Base		PB 0.1 Vp-p
IC101 Pin 7		PB 2.0 Vp-p	Q1106 Emitter		PB 1.2 Vp-p
Q1002 Base		PB 0.5 Vp-p	IC111 Pin 7		PB 0.5 Vp-p
IC101 Pin 9		PB 0.6 Vp-p	IC111 Pin 5		PB 1.2 Vp-p
IC101 Pins 10/12		PB 0.5 Vp-p	IC111 Pin 24		PB 0.22 Vp-p
IC101 Pin 21		PB 2 Vp-p	IC111 Pin 23		PB 0.6 Vp-p

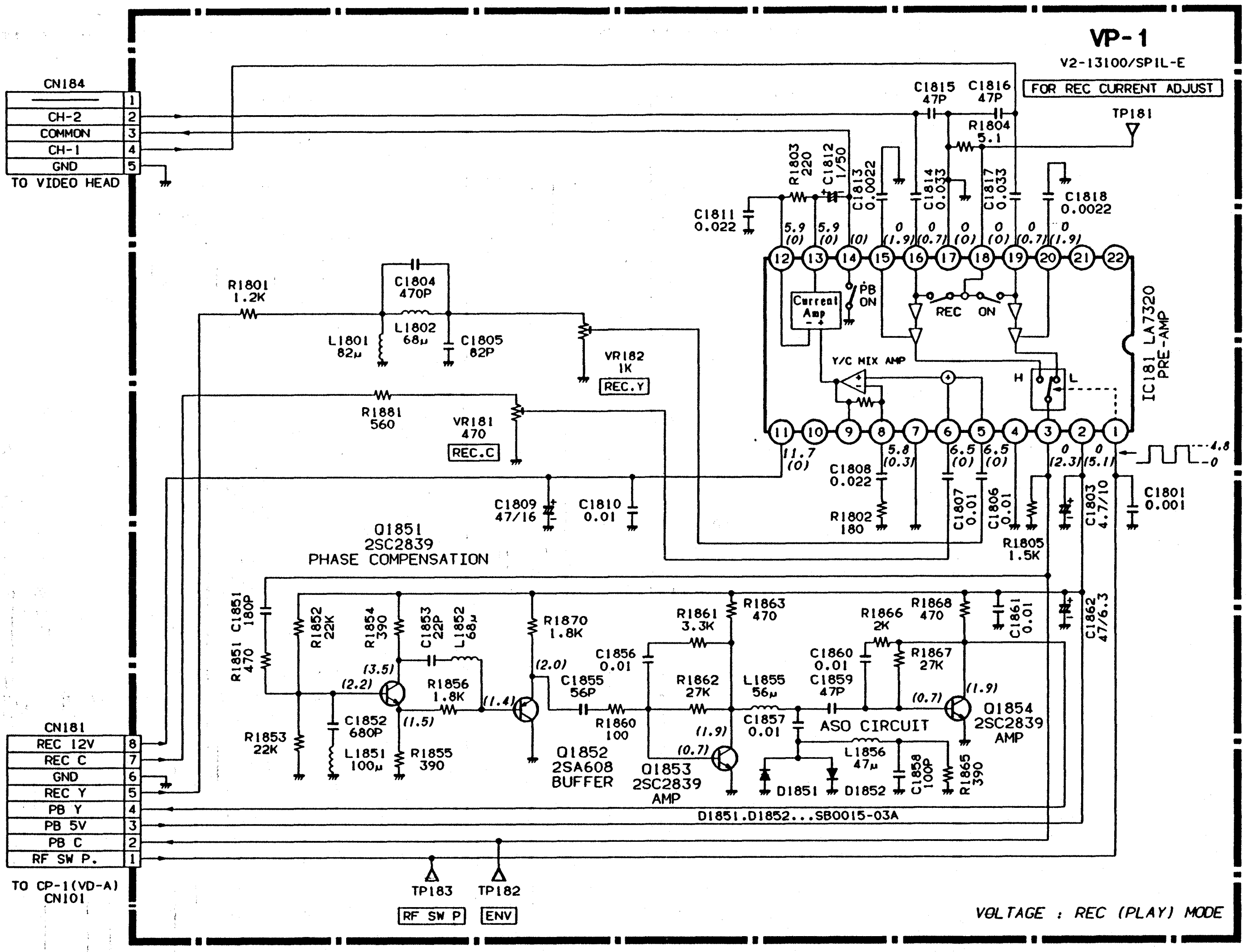
VD-1 BOARD MESECAM DISCRIMINATION CIRCUIT DIAGRAM


VD-1
V3-13101/SP1-EX2
CN171
B.G.
REC C
PB 5V
PB C
GND
SWD 5V
MESECAM H
PAL H
TO CP-1(VD-A)
R1701 10K
R1702 2.7K
R1703 1.2K
Q1701 2SC2814 B.G.P DET
R1711 10K
D1701 GMA01 or 1SS133
PAL: 4.4 MESECAM:0
PAL: 0 MESECAM:4.3
B1701 2SC3398 SWITCH
C1701 0.01
XF171
XF172
C1702 82P
C1703 10/16
R1705 22K
C1704 0.1
R1704 1K
IC171 BA7025L PAL/SECAM DISCRIMINATION
REC.C
SW
DET
REG
COMP 1
COMP 2
PB.C
GND
R1710 22K
C1706 0.01
R1709 430
R1707 2.2K
R1708 150K
C1705 10/16
R1706 1K
VOLTAGE : REC(PLAY) MODE

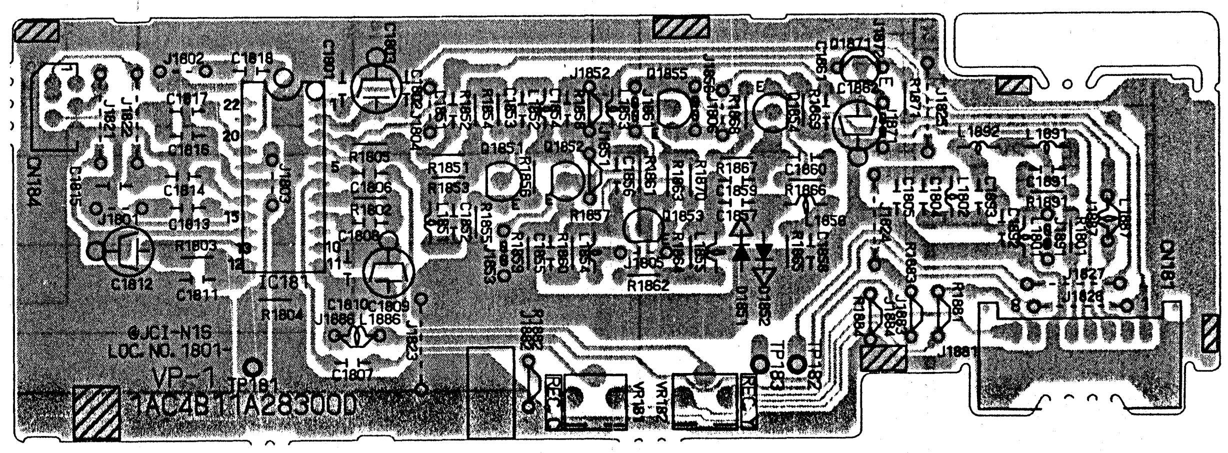
VD-1 P.C.B.


XF172
R1704
C1705
IC171
R1705
R1706
R1709
R1707
R1710
R1708
B1702
R1701
R1702

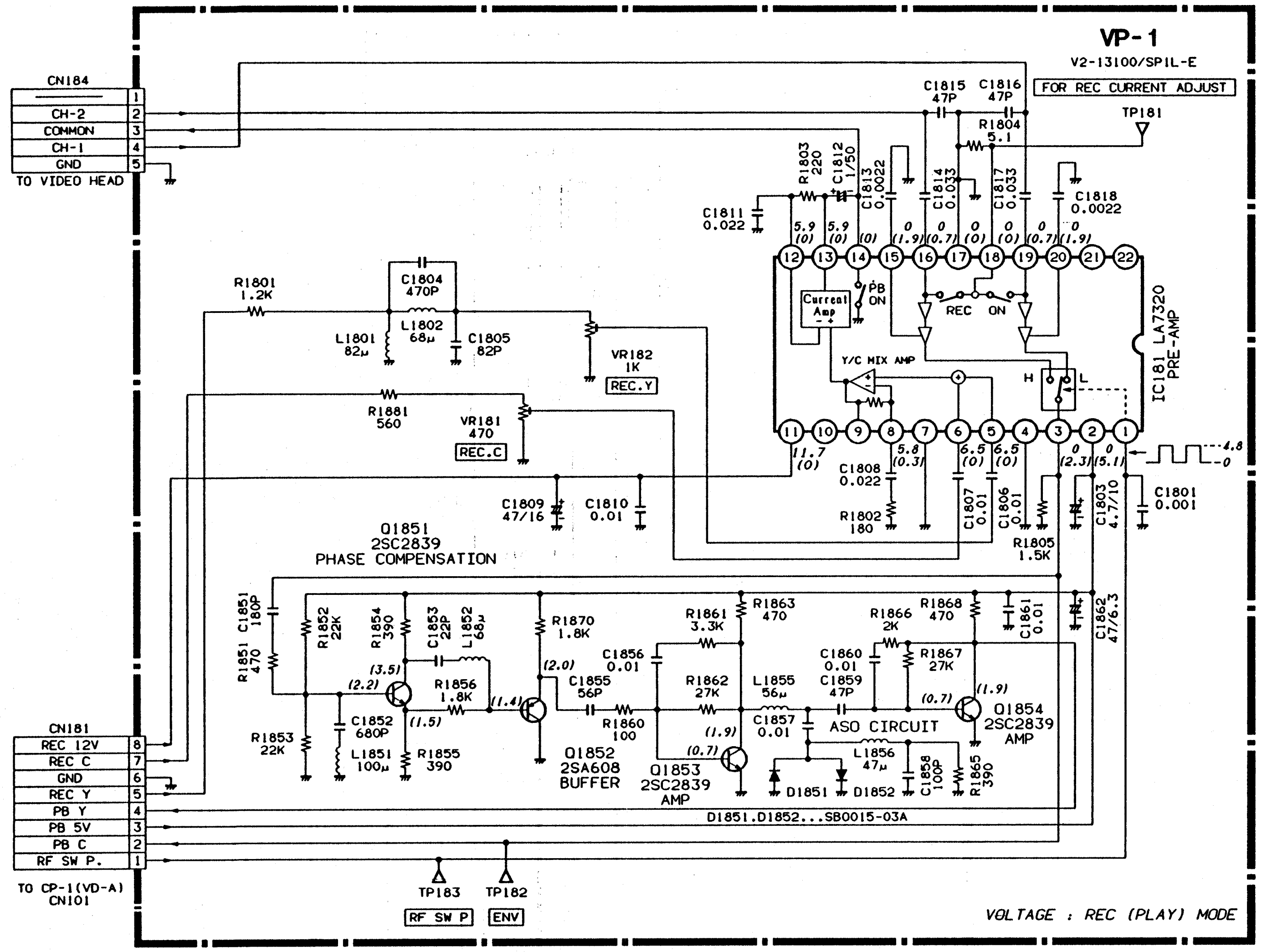
VP-1 BOARD VIDEO PRE-AMP CIRCUIT DIAGRAM


VP-1
V2-13100/SP1L-E
FOR REC CURRENT ADJUST
TP181
CN184
CH-2
COMMON
CH-1
GND
TO VIDEO HEAD
C1815 47P
C1816 47P
R1804 5.1
C1818 0.0022
C1811 0.022
IC181 LA7320 PRE-AMP
Current Amp
PB ON
REC ON
Y/C MIX AMP
R1801 1.2K
C1804 470P
L1802 68μ
L1801 82μ
C1805 82P
VR182 1K REC.Y
R1881 560
VR181 470 REC.C
C1809 47/16
C1810 0.01
C1808 0.022
R1802 180
R1805 1.5K
C1801 0.001
Q1851 2SC2839 PHASE COMPENSATION
Q1852 2SA608 BUFFER
Q1853 2SC2839 AMP
Q1854 2SC2839 AMP
ASO CIRCUIT
D1851 D1852
D1851.D1852...SB0015-03A
CN181
REC 12V
REC C
GND
REC Y
PB Y
PB 5V
PB C
RF SW P.
TO CP-1(VD-A) CN101
TP183 RF SW P
TP182 ENV
VOLTAGE : REC (PLAY) MODE

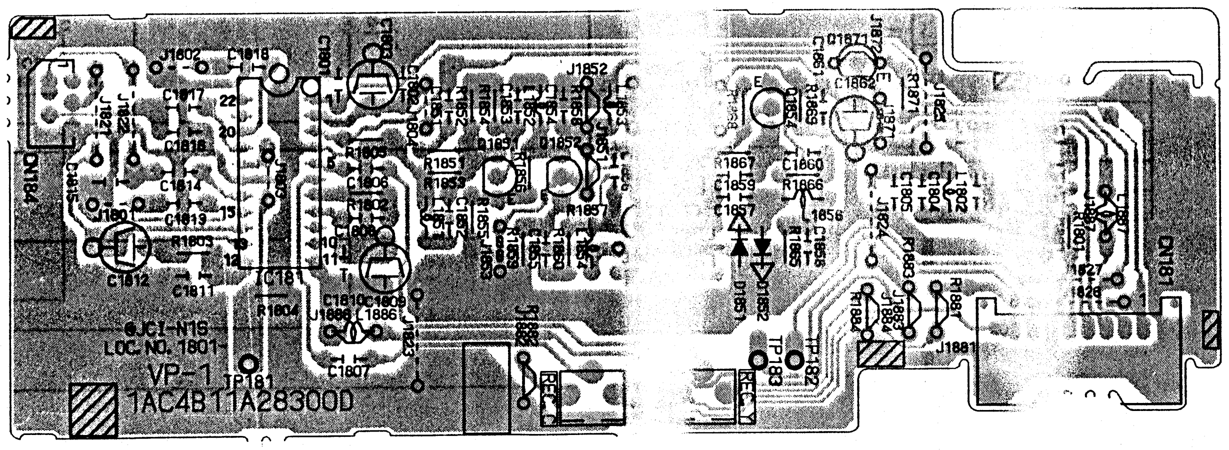
VP-1 P.C.B.


CN184
IC181
CN181
VP-1
1AC4B11A283000

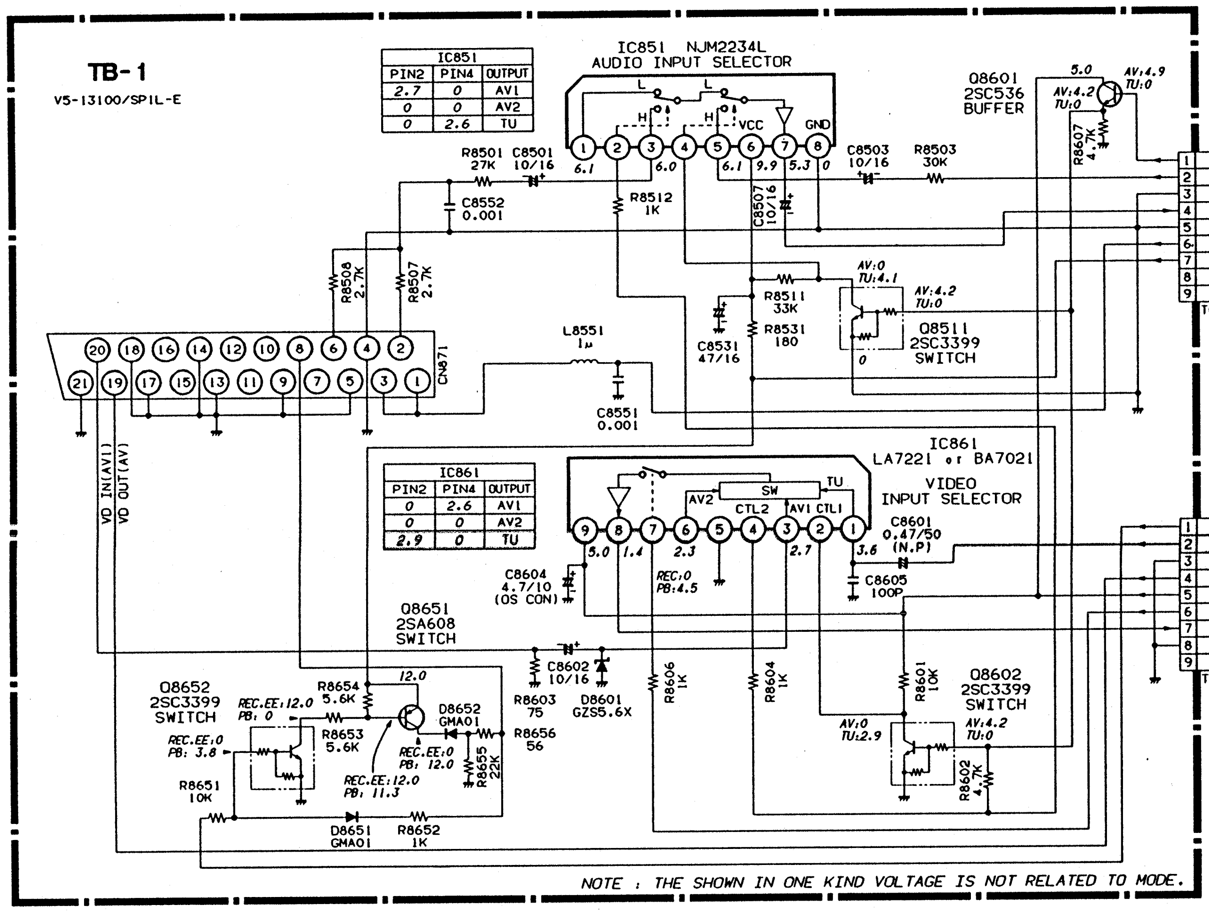
VP-1 BOARD VIDEO PRE-AMP CIRCUIT DIAGRAM


VP-1
V2-13100/SP1L-E
FOR REC CURRENT ADJUST
TP181
CN184
CH-2
COMMON
CH-1
GND
TO VIDEO HEAD
C1815 47P
C1816 47P
R1804 5.1
R1803 220
C1812 1/50
C1813 0.0022
C1814 0.033
C1817 0.033
C1818 0.0022
C1811 0.022
R1801 1.2K
C1804 470P
L1802 68μ
L1801 82μ
C1805 82P
VR182 1K
REC.Y
R1881 560
VR181 470
REC.C
Current Amp
PB ON
REC ON
Y/C MIX AMP
H
L
IC181 LA7320 PRE-AMP
C1808 0.022
R1802 180
C1807 0.01
C1806 0.01
R1805 1.5K
C1803 4.7/10
C1801 0.001
C1809 47/16
C1810 0.01
Q1851 2SC2839 PHASE COMPENSATION
R1851 470
C1851 180P
R1852 22K
R1854 390
C1853 22P
L1852 68μ
R1870 1.8K
R1861 3.3K
R1863 470
R1866 2K
R1868 470
C1861 0.01
C1862 47/6.3
C1856 0.01
C1860 0.01
R1867 27K
R1856 1.8K
C1855 56P
R1862 27K
L1855 56μ
C1859 47P
R1860 100
C1857 0.01
ASO CIRCUIT
Q1854 2SC2839 AMP
R1853 22K
C1852 680P
L1851 100μ
R1855 390
Q1852 2SA608 BUFFER
Q1853 2SC2839 AMP
L1856 47μ
D1851
D1852
C1858 100P
R1865 390
D1851.D1852...SB0015-03A
CN181
REC 12V
REC C
GND
REC Y
PB Y
PB 5V
PB C
RF SW P.
TO CP-1(VD-A) CN101
TP183
TP182
RF SW P
ENV
VOLTAGE : REC (PLAY) MODE

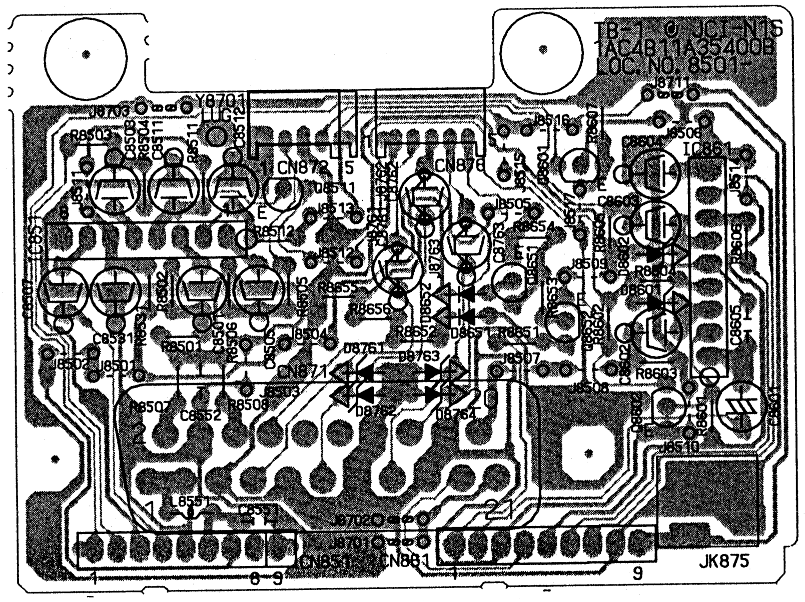
VP-1 P.C


CN184
CN181
TP181
@JC1-N16
LOC. NO. 1801
VP-1
1AC4B11A28300D
REC C
REC Y

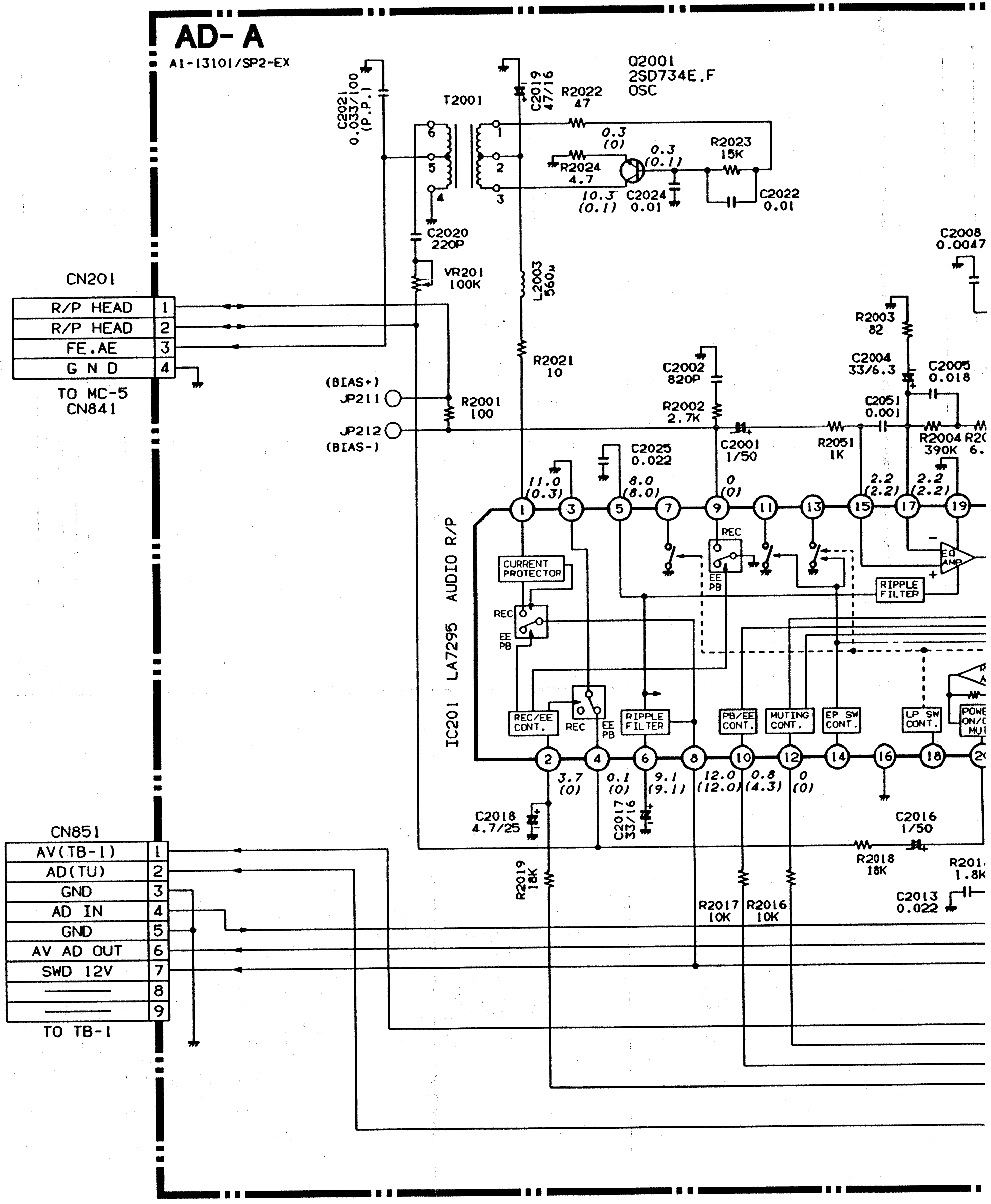
TB-1 BOARD INPUT/OUTPUT SELECTION & TERMINAL CIRCUIT DIAGRAM


TB-1
V5-13100/SPIL-E
IC851 NJM2234L AUDIO INPUT SELECTOR
IC851 PIN2 PIN4 OUTPUT
Q8601 2SC536 BUFFER
Q8511 2SC3399 SWITCH
CN851
AV(TB-1)
AD(TU)
GND
AD IN
GND
AV AD OUT
SWD 12V
TO CP-1(AD-A)
CN871
L8551
IC861 LA7221 or BA7021 VIDEO INPUT SELECTOR
CN861
AV CTL(FSS)
VD(TU)
GND
VD OUT(AV)
SWD 5V
PB 5V
VD IN
GND
TO CP-1(VD-A)
Q8651 2SA608 SWITCH
Q8652 2SC3399 SWITCH
Q8602 2SC3399 SWITCH
D8601 GZS5.6X
D8652 GMA01
D8651 GMA01
VD IN(AV1)
VD OUT(AV1)
NOTE : THE SHOWN IN ONE KIND VOLTAGE IS NOT RELATED TO MODE.

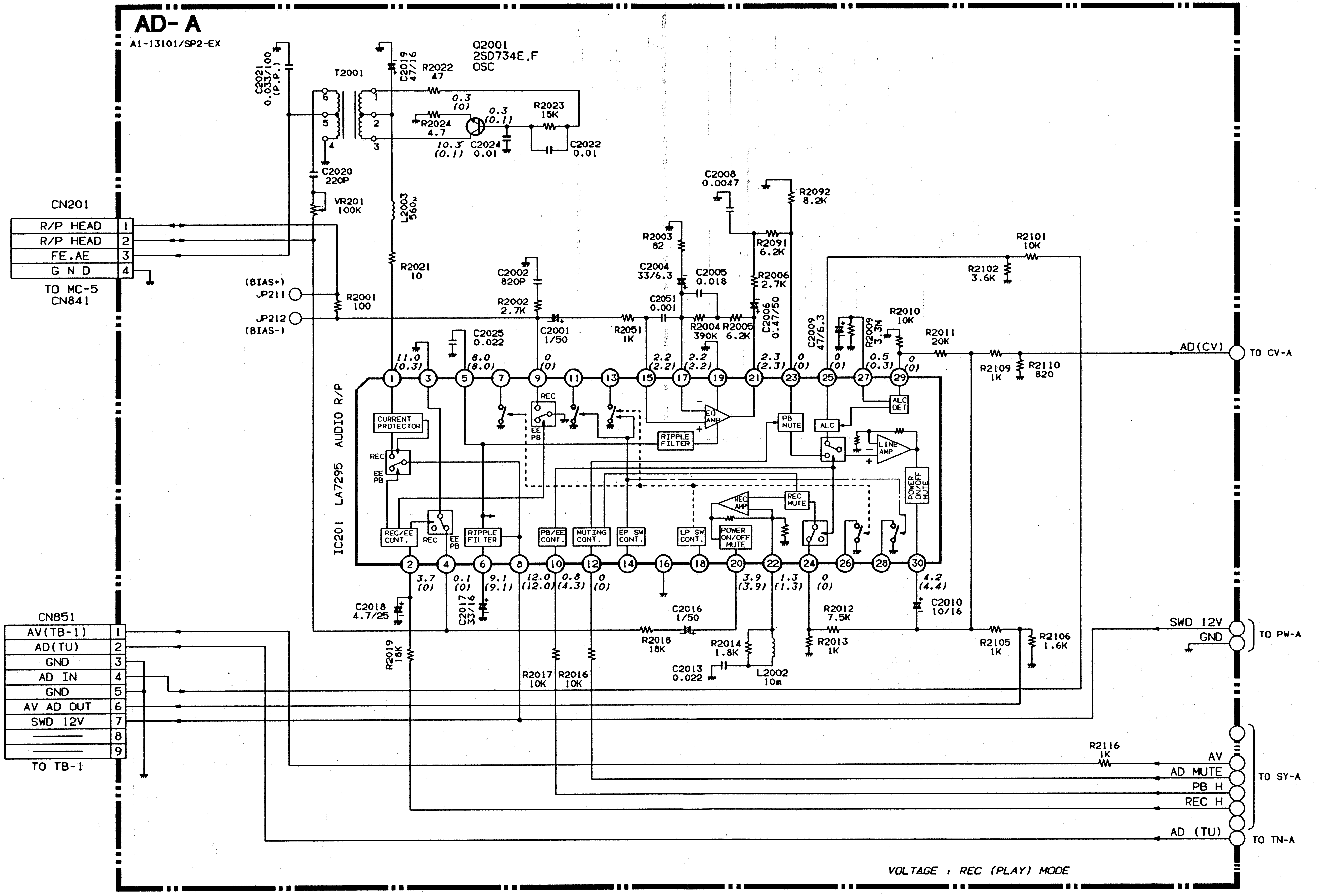
TB-1 P.C.B.


TB-1 © JCI-N1S
AC4B11A35400B
LOC. NO. 8501-
JK875

CP-1 BOARD (AD-A) AUDIO CIRCU

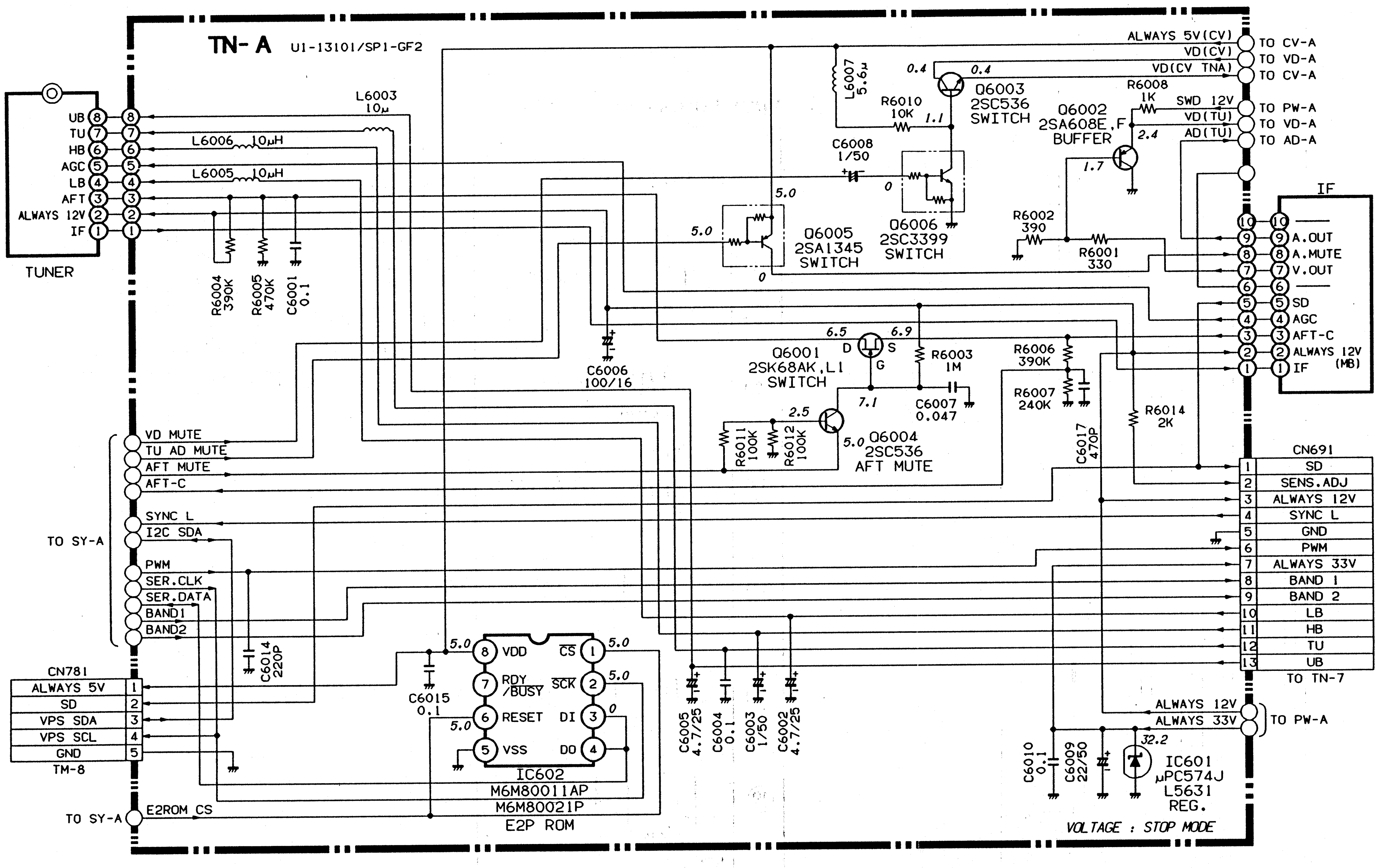

AD- A
A1-13101/SP2-EX
CN201
R/P HEAD
R/P HEAD
FE.AE
G N D
TO MC-5 CN841
T2001
Q2001 2SD734E,F OSC
VR201 100K
(BIAS+) JP211
JP212 (BIAS-)
IC201 LA7295 AUDIO R/P
CURRENT PROTECTOR
REC/EE CONT.
RIPPLE FILTER
PB/EE CONT.
MUTING CONT.
EP SW CONT.
LP SW CONT.
EQ AMP
CN851
AV(TB-1)
AD(TU)
GND
AD IN
GND
AV AD OUT
SWD 12V
TO TB-1

CP-1 BOARD (AD-A) AUDIO CIRCUIT DIAGRAM

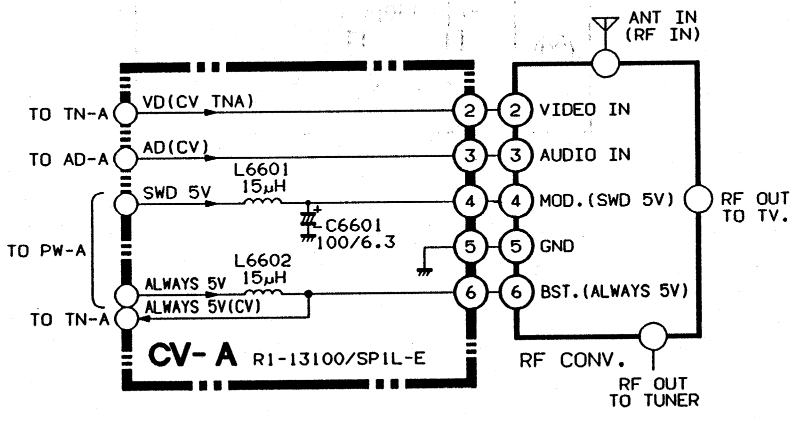

AD- A
A1-13101/SP2-EX
Q2001
2SD734E.F
OSC
T2001
C2021 100
0.033/100 (P.P.)
C2019 47/16
R2022 47
R2024 4.7
R2023 15K
C2024 0.01
C2022 0.01
C2020 220P
VR201 100K
L2003 560μ
R2021 10
R2001 100
(BIAS+) JP211
JP212 (BIAS-)
CN201
R/P HEAD 1
R/P HEAD 2
FE.AE 3
G N D 4
TO MC-5 CN841
C2002 820P
R2002 2.7K
C2025 0.022
C2001 1/50
R2051 1K
R2003 82
C2004 33/6.3
C2005 0.018
C2051 0.001
R2004 390K
R2005 6.2K
C2008 0.0047
R2092 8.2K
R2091 6.2K
R2006 2.7K
C2006 0.47/50
C2009 47/6.3
R2009 3.3M
R2010 10K
R2011 20K
R2101 10K
R2102 3.6K
R2109 1K
R2110 820
AD(CV)
TO CV-A
IC201 LA7295 AUDIO R/P
CURRENT PROTECTOR
REC
EE PB
REC/EE CONT.
RIPPLE FILTER
PB/EE CONT.
MUTING CONT.
EP SW CONT.
LP SW CONT.
POWER ON/OFF MUTE
EQ AMP
PB MUTE
ALC
ALC DET
LINE AMP
REC AMP
REC MUTE
POWER ON/OFF MUTE
11.0 (0.3)
8.0 (8.0)
0 (0)
2.2 (2.2)
2.2 (2.2)
2.3 (2.3)
0 (0)
0 (0)
0.5 (0.3)
0 (0)
0.3 (0)
0.3 (0.1)
10.3 (0.1)
3.7 (0)
0.1 (0)
9.1 (9.1)
12.0 (12.0)
0.8 (4.3)
0 (0)
3.9 (3.9)
1.3 (1.3)
0 (0)
4.2 (4.4)
C2018 4.7/25
C2017 33/16
C2016 1/50
R2018 18K
R2019 18K
R2017 10K
R2016 10K
R2014 1.8K
C2013 0.022
L2002 10m
R2012 7.5K
R2013 1K
C2010 10/16
R2105 1K
R2106 1.6K
SWD 12V
GND
TO PW-A
CN851
AV(TB-1) 1
AD(TU) 2
GND 3
AD IN 4
GND 5
AV AD OUT 6
SWD 12V 7
8
9
TO TB-1
R2116 1K
AV
AD MUTE
PB H
REC H
TO SY-A
AD (TU)
TO TN-A
VOLTAGE : REC (PLAY) MODE

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

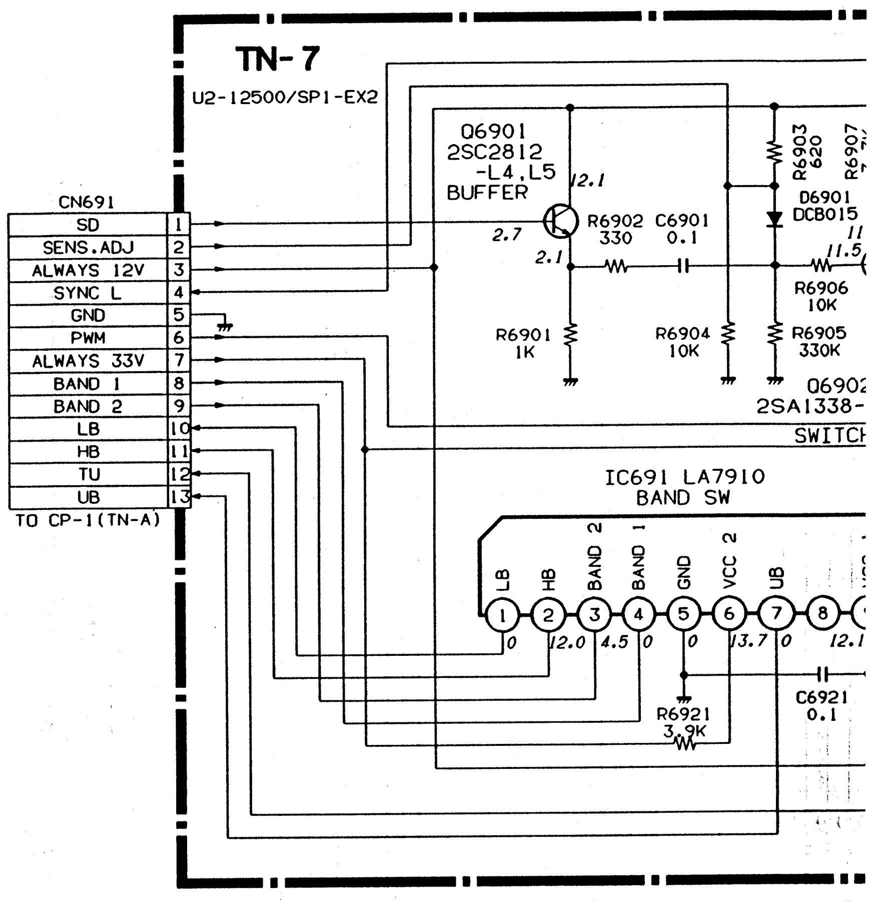
CP-1 BOARD (TN-A) TUNER IF CONNECTION CIRCUIT DIAGRAM


TN- A U1-13101/SP1-GF2
TUNER
UB 8
TU 7
HB 6
AGC 5
LB 4
AFT 3
ALWAYS 12V 2
IF 1
L6003 10μ
L6006 10μH
L6005 10μH
R6004 390K
R6005 470K
C6001 0.1
L6007 5.6μ
C6008 1/50
R6010 10K
Q6003 2SC536 SWITCH
Q6002 2SA608E,F BUFFER
R6008 1K
Q6005 2SA1345 SWITCH
Q6006 2SC3399 SWITCH
R6002 390
R6001 330
ALWAYS 5V(CV)
VD(CV)
VD(CV TNA)
SWD 12V
VD(TU)
AD(TU)
TO CV-A
TO VD-A
TO CV-A
TO PW-A
TO VD-A
TO AD-A
IF
A.OUT
A.MUTE
V.OUT
SD
AGC
AFT-C
ALWAYS 12V
IF (MB)
C6006 100/16
Q6001 2SK68AK,L1 SWITCH
R6003 1M
C6007 0.047
R6006 390K
R6007 240K
R6014 2K
Q6004 2SC536 AFT MUTE
R6011 100K
R6012 100K
C6017 470P
VD MUTE
TU AD MUTE
AFT MUTE
AFT-C
SYNC L
I2C SDA
PWM
SER.CLK
SER.DATA
BAND1
BAND2
TO SY-A
C6014 220P
CN691
1 SD
2 SENS.ADJ
3 ALWAYS 12V
4 SYNC L
5 GND
6 PWM
7 ALWAYS 33V
8 BAND 1
9 BAND 2
10 LB
11 HB
12 TU
13 UB
TO TN-7
CN781
1 ALWAYS 5V
2 SD
3 VPS SDA
4 VPS SCL
5 GND
TM-8
C6015 0.1
VDD
RDY /BUSY
RESET
VSS
CS
SCK
DI
DO
IC602 M6M80011AP M6M80021P E2P ROM
TO SY-A
E2ROM CS
C6005 4.7/25
C6004 0.1
C6003 1/50
C6002 4.7/25
ALWAYS 12V
ALWAYS 33V
TO PW-A
C6010 0.1
C6009 22/50
IC601 μPC574J L5631 REG.
VOLTAGE : STOP MODE

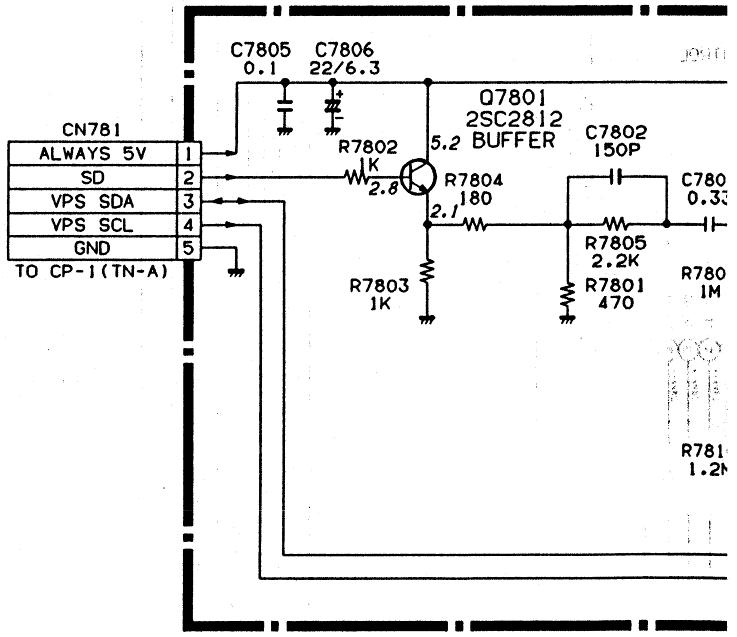
CP-1 BOARD (CV-A) RF CONVERTER CONNECTION CIRCUIT DIAGRAM


ANT IN (RF IN)
TO TN-A
VD(CV TNA)
TO AD-A
AD(CV)
L6601 15μH
SWD 5V
C6601 100/6.3
TO PW-A
L6602 15μH
ALWAYS 5V
TO TN-A
ALWAYS 5V(CV)
CV- A R1-13100/SP1L-E
VIDEO IN
AUDIO IN
MOD.(SWD 5V)
GND
BST.(ALWAYS 5V)
RF OUT TO TV.
RF CONV.
RF OUT TO TUNER

TN-7 BOARD SYNC DET. & TUNING C


TN- 7
U2-12500/SP1-EX2
CN691
SD
SENS.ADJ
ALWAYS 12V
SYNC L
GND
PWM
ALWAYS 33V
BAND 1
BAND 2
LB
HB
TU
UB
TO CP-1(TN-A)
Q6901 2SC2812 -L4,L5 BUFFER
R6902 330
C6901 0.1
R6903 620
D6901 DCB015
R6906 10K
R6901 1K
R6904 10K
R6905 330K
Q6902 2SA1338-
SWITCH
IC691 LA7910 BAND SW
LB
HB
BAND 2
BAND 1
GND
VCC 2
UB
R6921 3.9K
C6921 0.1

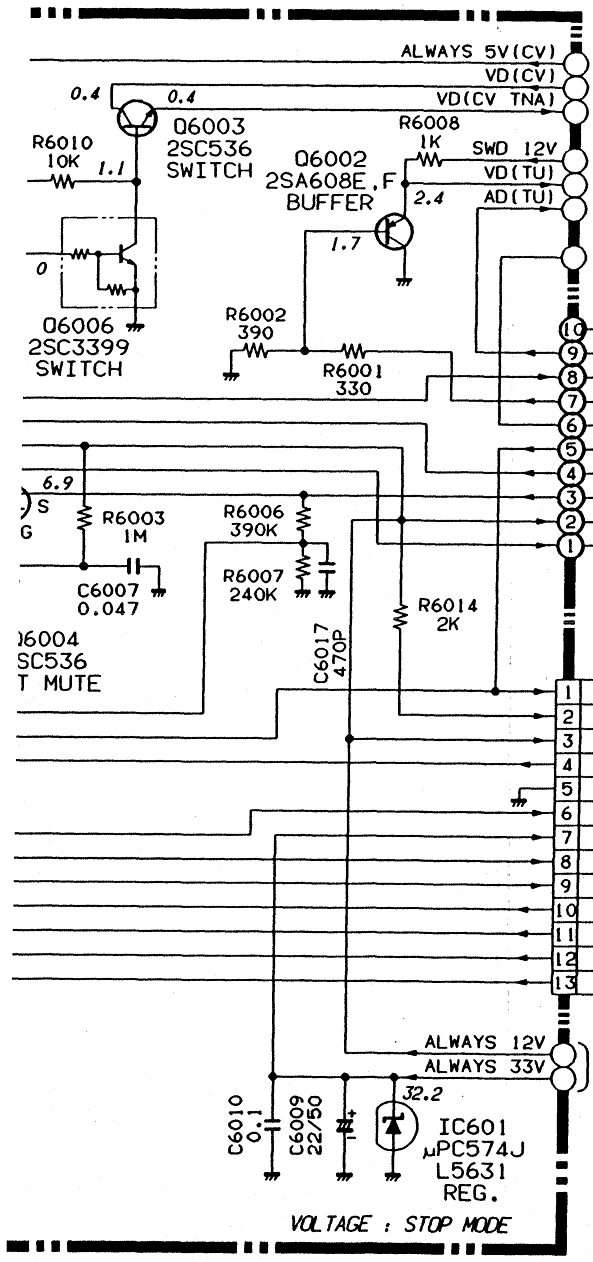
TM-8 BOARD VPS CI


C7805 0.1
C7806 22/6.3
Q7801 2SC2812 BUFFER
C7802 150P
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
GND
TO CP-1(TN-A)
R7802 1K
R7804 180
R7805 2.2K
R7803 1K
R7801 470
R780 1M
R781 1.2M

K
J
I
H
G
F
E
D
C
B
A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

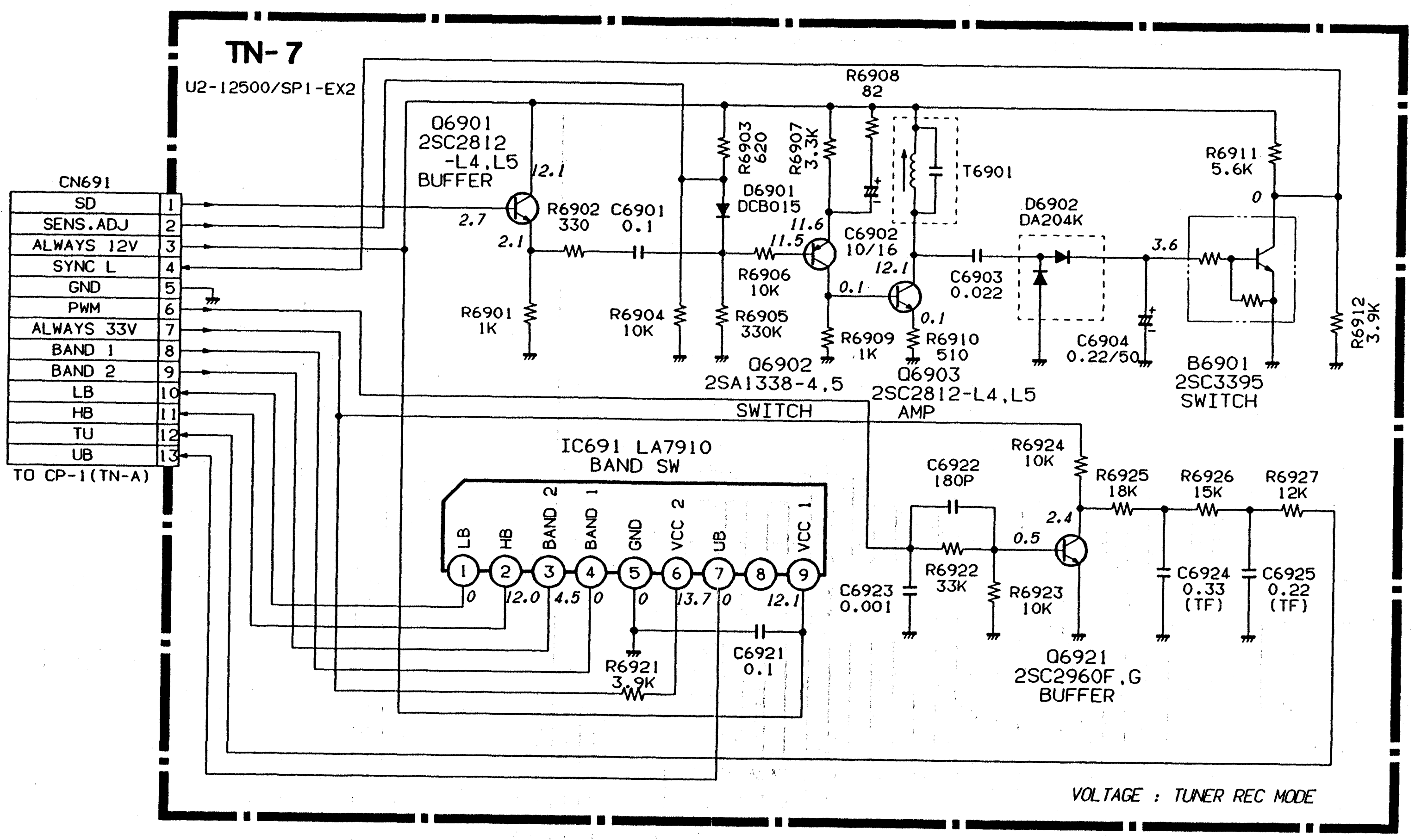
RCUIT DIAGRAM


ALWAYS 5V(CV)
VD(CV)
VD(CV TNA)
TO CV-A
TO VD-A
TO CV-A
R6010 10K
Q6003 2SC536 SWITCH
R6008 1K
Q6002 2SA608E,F BUFFER
SWD 12V
VD(TU)
AD(TU)
TO PW-A
TO VD-A
TO AD-A
Q6006 2SC3399 SWITCH
R6002 390
R6001 330
IF
A.OUT
A.MUTE
V.OUT
SD
AGC
AFT-C
ALWAYS 12V (MB)
IF
R6003 1M
R6006 390K
C6007 0.047
R6007 240K
Q6004 2SC536 T MUTE
C6017 470P
R6014 2K
CN691
SD
SENS.ADJ
ALWAYS 12V
SYNC L
GND
PWM
ALWAYS 33V
BAND 1
BAND 2
LB
HB
TU
UB
TO TN-7
ALWAYS 12V
ALWAYS 33V
TO PW-A
C6010 0.1
C6009 22/50
IC601 μPC574J L5631 REG.
32.2
VOLTAGE : STOP MODE

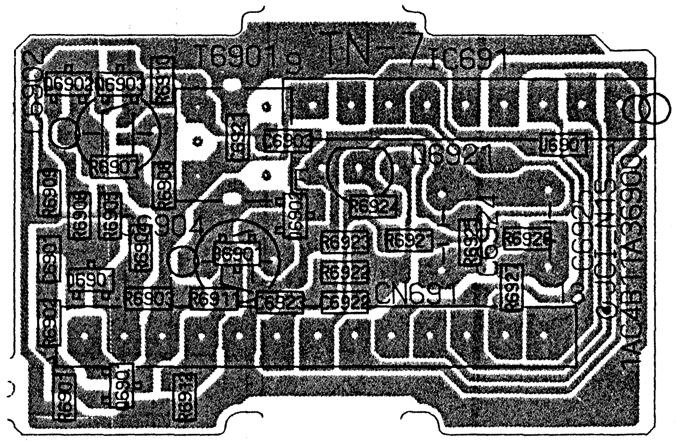
)IAGRAM

RF OUT
TO TV.

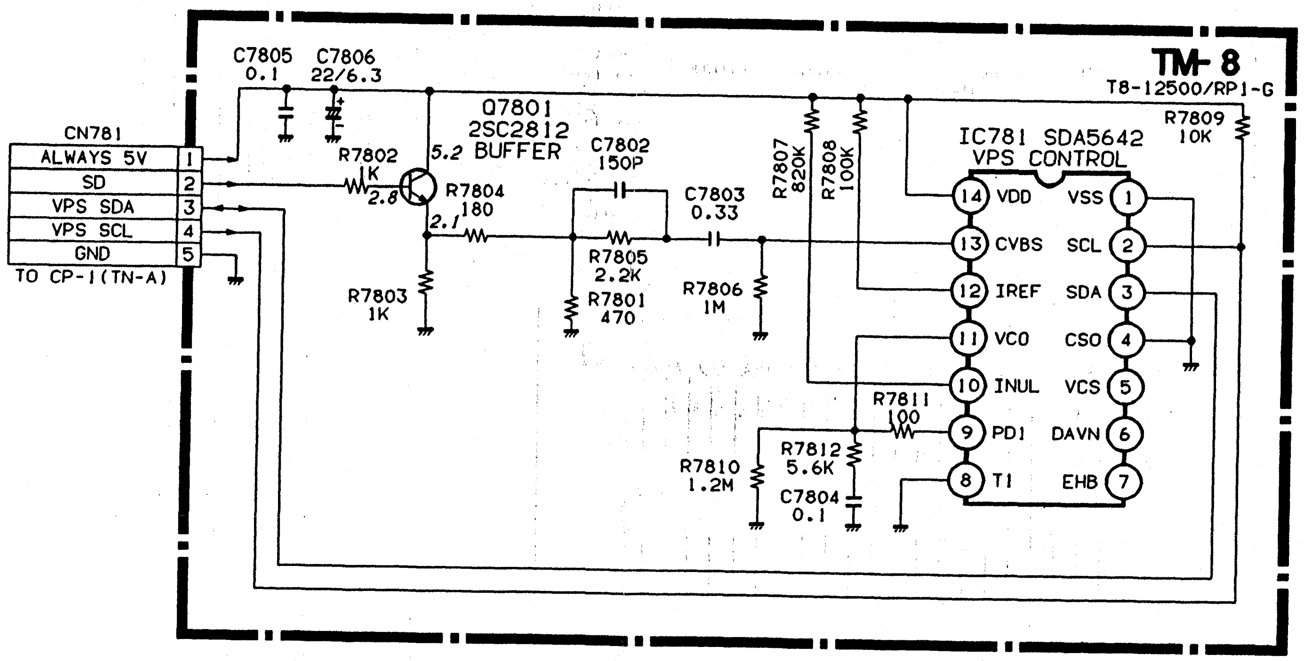
TN-7 BOARD SYNC DET. & TUNING CONTROL CIRCUIT DIAGRAM


TN-7
U2-12500/SP1-EX2
CN691
SD
SENS.ADJ
ALWAYS 12V
SYNC L
GND
PWM
ALWAYS 33V
BAND 1
BAND 2
LB
HB
TU
UB
TO CP-1(TN-A)
Q6901 2SC2812 -L4,L5 BUFFER
R6902 330
C6901 0.1
R6908 82
R6903 620
R6907 3.3K
D6901 DCB015
T6901
R6911 5.6K
D6902 DA204K
C6902 10/16
R6906 10K
C6903 0.022
R6901 1K
R6904 10K
R6905 330K
R6909 1K
R6910 510
Q6902 2SA1338-4,5 SWITCH
Q6903 2SC2812-L4,L5 AMP
C6904 0.22/50
B6901 2SC3395 SWITCH
R6912 3.9K
IC691 LA7910 BAND SW
LB
HB
BAND 2
BAND 1
GND
VCC 2
UB
VCC 1
C6922 180P
R6924 10K
R6925 18K
R6926 15K
R6927 12K
R6922 33K
R6923 10K
C6923 0.001
C6924 0.33 (TF)
C6925 0.22 (TF)
Q6921 2SC2960F,G BUFFER
R6921 3.9K
C6921 0.1
VOLTAGE : TUNER REC MODE

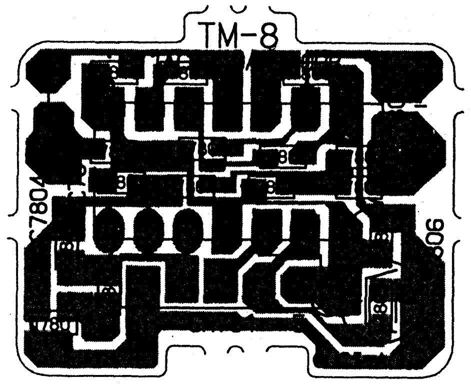
TN-7 P.C.B.



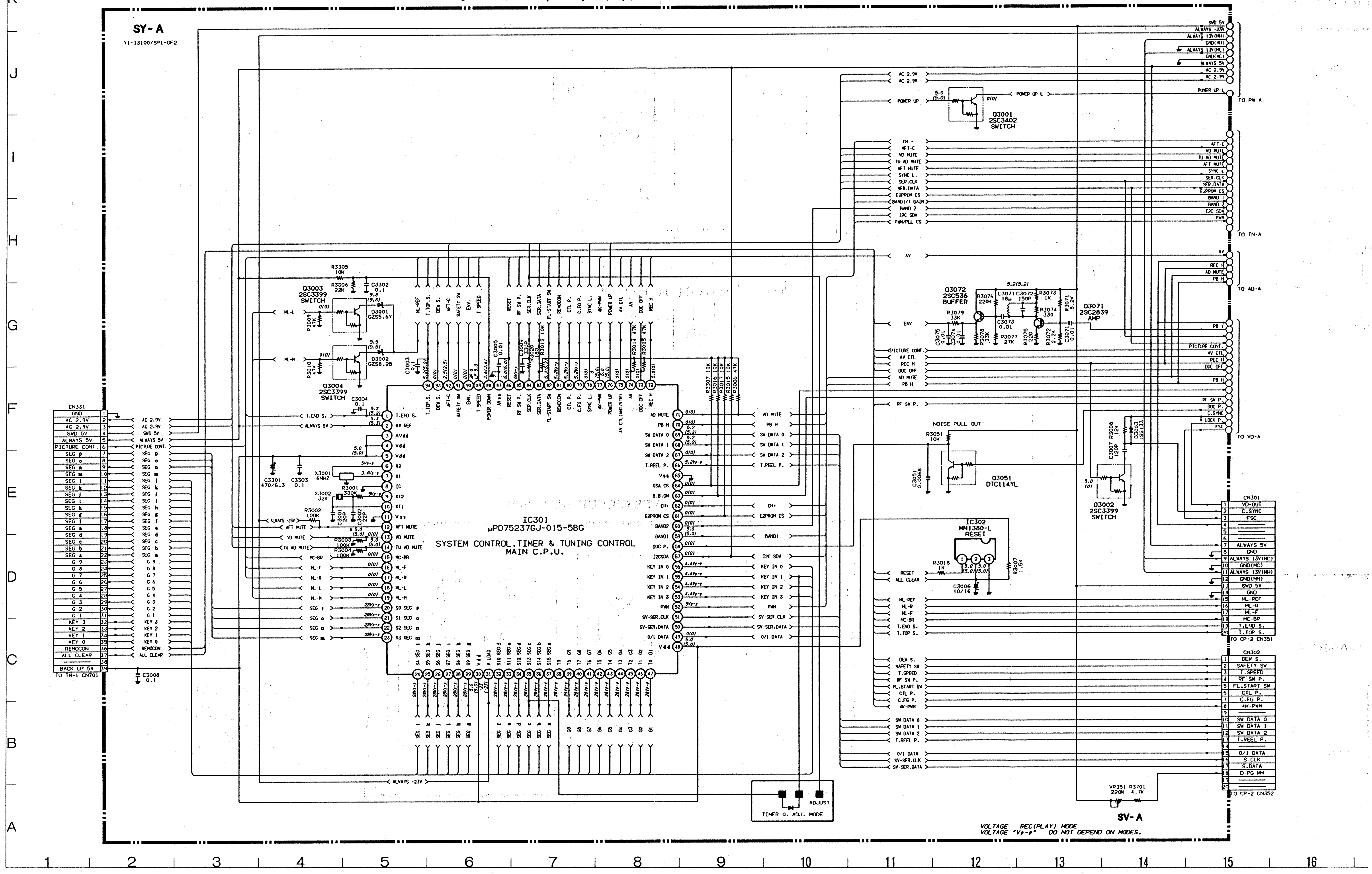
TM-8 BOARD VPS CIRCUIT DIAGRAM


TM-8
T8-12500/RP1-G
C7805 0.1
C7806 22/6.3
Q7801 2SC2812 BUFFER
R7802 1K
C7802 150P
C7803 0.33
R7804 180
R7805 2.2K
R7801 470
R7803 1K
R7806 1M
R7807 820K
R7808 100K
R7809 10K
IC781 SDA5642 VPS CONTROL
VDD
VSS
CVBS
SCL
IREF
SDA
VCO
CSO
INUL
VCS
PD1
DAVN
T1
EHB
R7811 100
R7812 5.6K
R7810 1.2M
C7804 0.1
CN781
ALWAYS 5V
SD
VPS SDA
VPS SCL
GND
TO CP-1(TN-A)

TM-8 P.C.B.

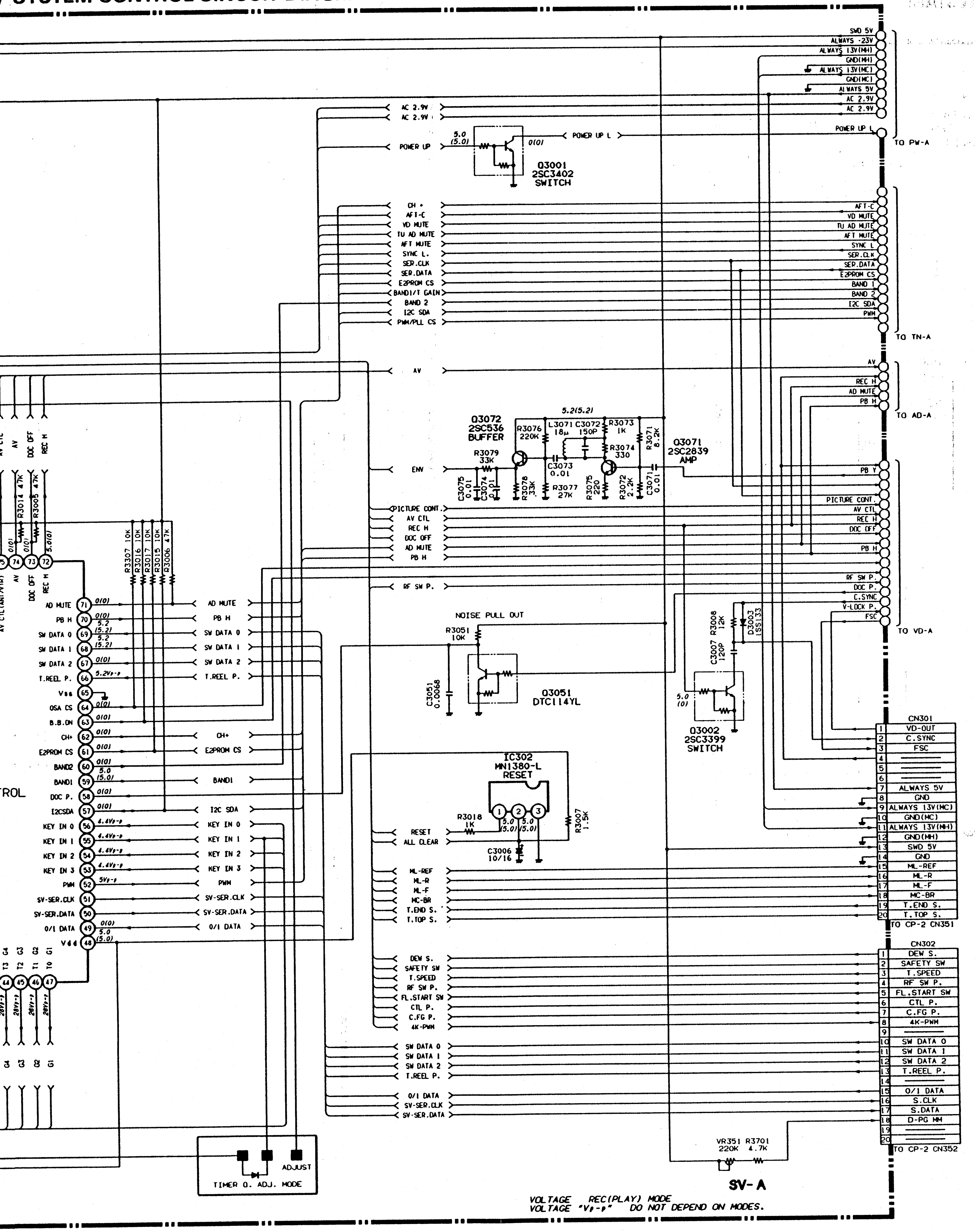


CP-1 BOARD (SY-A, SV-A) SYSTEM CONTROL CIRCUIT DIAGRAM


SY-A
Y1-13100/SP1-GF2
IC301
μPD75237GJ-015-5BG
SYSTEM CONTROL, TIMER & TUNING CONTROL
MAIN C.P.U.
Q3003
2SC3399
SWITCH
Q3004
2SC3399
SWITCH
D3001
GZS5.6Y
D3002
GZS8.2B
R3305
10K
R3306
22K
C3302
0.1
R3009
47K
R3010
47K
C3003
0.1
C3004
0.1
C3005
0.01
C3301
470/6.3
C3303
0.1
X3001
6MHZ
X3002
32K
R3001
330K
R3002
100K
C3001
30P
C3002
22P
R3003
100K
R3004
100K
R3307 10K
R3016 10K
R3017 10K
R3015 10K
R3006 47K
R3014 47K
R3008 47K
R3012 10K
CN331
TO TM-1 CN701
C3008
0.1
GND
AC 2.9V
AC 2.9V
SWD 5V
ALWAYS 5V
PICTURE CONT.
SEG p
SEG o
SEG n
SEG m
SEG l
SEG k
SEG j
SEG i
SEG h
SEG g
SEG f
SEG e
SEG d
SEG c
SEG b
SEG a
G 9
G 8
G 7
G 6
G 5
G 4
G 3
G 2
G 1
KEY 3
KEY 2
KEY 1
KEY 0
REMOCON
ALL CLEAR
BACK UP 5V
T.END S.
AV REF
AVdd
Vdd
X2
X1
IC
XT2
XT1
Vss
AFT MUTE
VD MUTE
TU AD MUTE
MC-BR
ML-F
ML-R
ML-L
ML-M
S0 SEG p
S1 SEG o
S2 SEG n
S3 SEG m
ALWAYS -23V
ML-REF
T.TOP S.
DEW S.
AFT-C
SAFETY SW
ENV.
T SPEED
POWER DOWN
AVss
RESET
RF SW P.
SER.CLK
SER.DATA
FL-START SW
REMOCON
CTL P.
C.FG P.
SYNC L.
4K-PWM
POWER UP
AV CTL(ANT/VTR)
AV
DOC OFF
REC H
AD MUTE
PB H
SW DATA 0
SW DATA 1
SW DATA 2
T.REEL P.
Vss
OSA CS
B.B.ON
CH+
E2PROM CS
BAND2
BAND1
DOC P.
I2CSDA
KEY IN 0
KEY IN 1
KEY IN 2
KEY IN 3
PWM
SV-SER.CLK
SV-SER.DATA
0/1 DATA
Vdd
S4 SEG l
S5 SEG k
S6 SEG j
S7 SEG i
S8 SEG h
S9 SEG g
V44
V LOAD
S10 SEG f
S11 SEG e
S12 SEG d
S13 SEG c
S14 SEG b
S15 SEG a
T9
T8
T7
T6
T5
T4
T3
T2
T1
T0
TIMER 0. ADJ. MODE
ADJUST
Q3001
2SC3402
SWITCH
SWD 5V
ALWAYS -23V
ALWAYS 13V(MH)
GND(MH)
ALWAYS 13V(MC)
GND(MC)
ALWAYS 5V
AC 2.9V
AC 2.9V
POWER UP L
TO PW-A
CH +
AFT-C
VD MUTE
TU AD MUTE
AFT MUTE
SYNC L.
SER.CLK
SER.DATA
E2PROM CS
BAND1/1 GAIN
BAND 2
I2C SDA
PWM/PLL CS
TO TN-A
AV
REC H
AD MUTE
PB H
TO AD-A
Q3072
2SC536
BUFFER
Q3071
2SC2839
AMP
R3076
220K
L3071
18μ
C3072
150P
R3073
1K
R3074
330
R3071
8.2K
R3079
33K
C3073
0.01
R3078
33K
R3077
27K
R3075
220
R3072
2.2K
C3071
0.01
C3075
0.01
C3074
0.01
ENV
PB Y
PICTURE CONT.
AV CTL
DOC OFF
RF SW P.
DOC P.
C.SYNC
V-LOCK P.
FSC
TO VD-A
NOISE PULL OUT
R3051
10K
Q3051
DTC114YL
C3051
0.0068
Q3002
2SC3399
SWITCH
R3008
12K
C3007
120P
D3003
1SS133
IC302
MN1380-L
RESET
R3018
1K
R3007
1.5K
C3006
10/16
RESET
ALL CLEAR
CN301
VD-OUT
C.SYNC
FSC
ALWAYS 5V
GND
ALWAYS 13V(MC)
GND(MC)
ALWAYS 13V(MH)
GND(MH)
SWD 5V
GND
ML-REF
ML-R
ML-F
MC-BR
T.END S.
T.TOP S.
TO CP-2 CN351
CN302
DEW S.
SAFETY SW
T.SPEED
RF SW P.
FL.START SW
CTL P.
C.FG P.
4K-PWM
SW DATA 0
SW DATA 1
SW DATA 2
T.REEL P.
0/1 DATA
S.CLK
S.DATA
D-PG MH
TO CP-2 CN352
VR351
220K
R3701
4.7K
SV-A
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

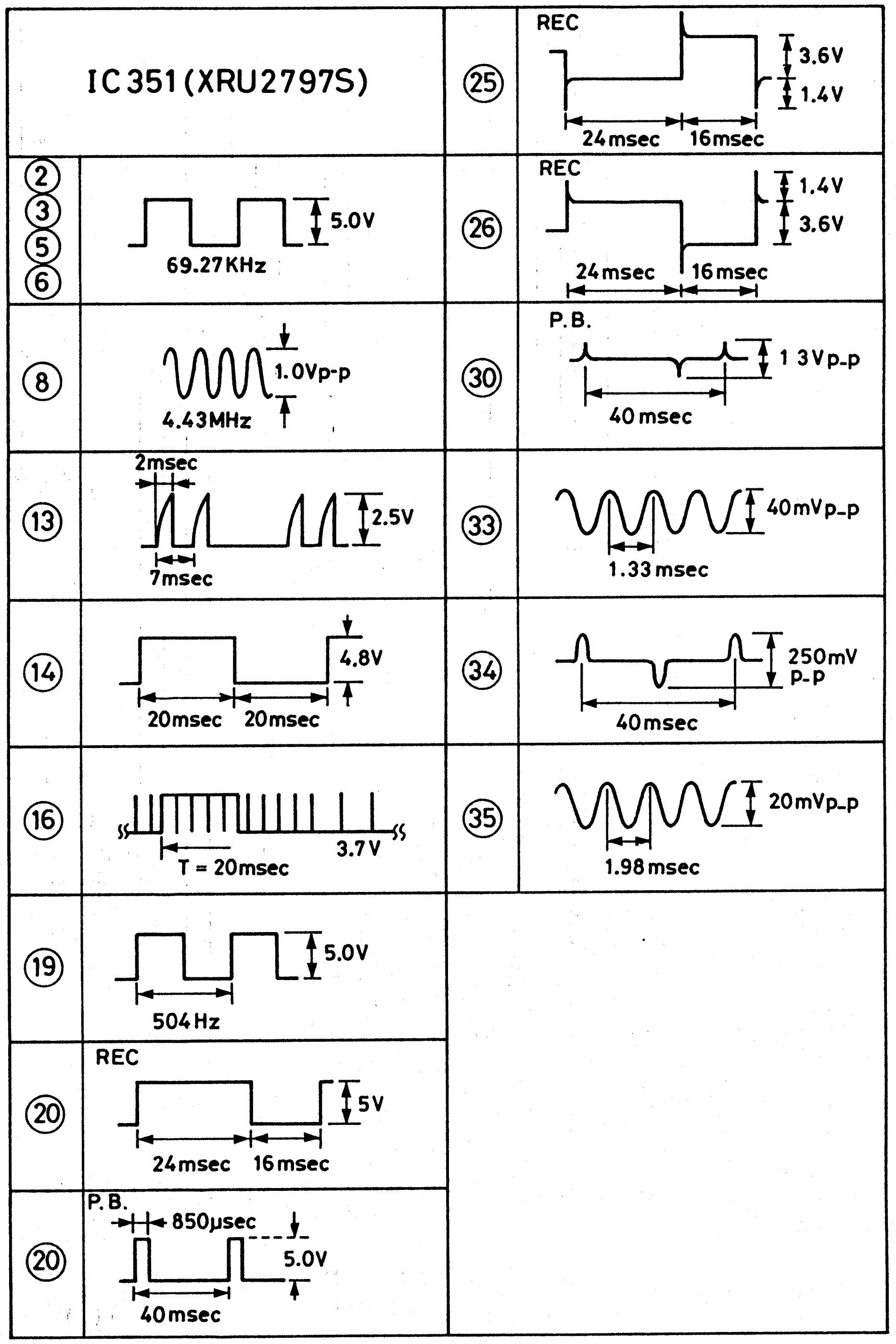
VOLTAGE REC(PLAY) MODE
VOLTAGE "Vp-p" DO NOT DEPEND ON MODES.

) SYSTEM CONTROL CIRCUIT DIAGRAM



SWD 5V
ALWAYS -23V
ALWAYS 13V(MH)
GND(MH)
ALWAYS 13V(MC)
GND(MC)
ALWAYS 5V
AC 2.9V
AC 2.9V
POWER UP L
TO PW-A
POWER UP
Q3001
2SC3402
SWITCH
CH +
AFT-C
VD MUTE
TU AD MUTE
AFT MUTE
SYNC L.
SER.CLK
SER.DATA
E2PROM CS
BAND1/T GAIN
BAND 2
I2C SDA
PWM/PLL CS
TO TN-A
AV
REC H
AD MUTE
PB H
TO AD-A
ENV
Q3072
2SC536
BUFFER
Q3071
2SC2839
AMP
PICTURE CONT.
AV CTL
DOC OFF
RF SW P.
DOC P.
C.SYNC
V-LOCK P.
FSC
TO VD-A
NOISE PULL OUT
Q3051
DTC114YL
Q3002
2SC3399
SWITCH
IC302
MN1380-L
RESET
RESET
ALL CLEAR
ML-REF
ML-R
ML-F
MC-BR
T.END S.
T.TOP S.
CN301
VD-OUT
C.SYNC
FSC
ALWAYS 5V
GND
ALWAYS 13V(MC)
GND(MC)
ALWAYS 13V(MH)
GND(MH)
SWD 5V
GND
ML-REF
ML-R
ML-F
MC-BR
T.END S.
T.TOP S.
TO CP-2 CN351
CN302
DEW S.
SAFETY SW
T.SPEED
RF SW P.
FL.START SW
CTL P.
C.FG P.
4K-PWM
SW DATA 0
SW DATA 1
SW DATA 2
T.REEL P.
0/1 DATA
S.CLK
S.DATA
D-PG MM
TO CP-2 CN352
SV-SER.CLK
SV-SER.DATA
VR351 220K
R3701 4.7K
ADJUST
TIMER 0. ADJ. MODE
SV-A
TROL
VOLTAGE REC(PLAY) MODE
VOLTAGE "Vp-p" DO NOT DEPEND ON MODES.

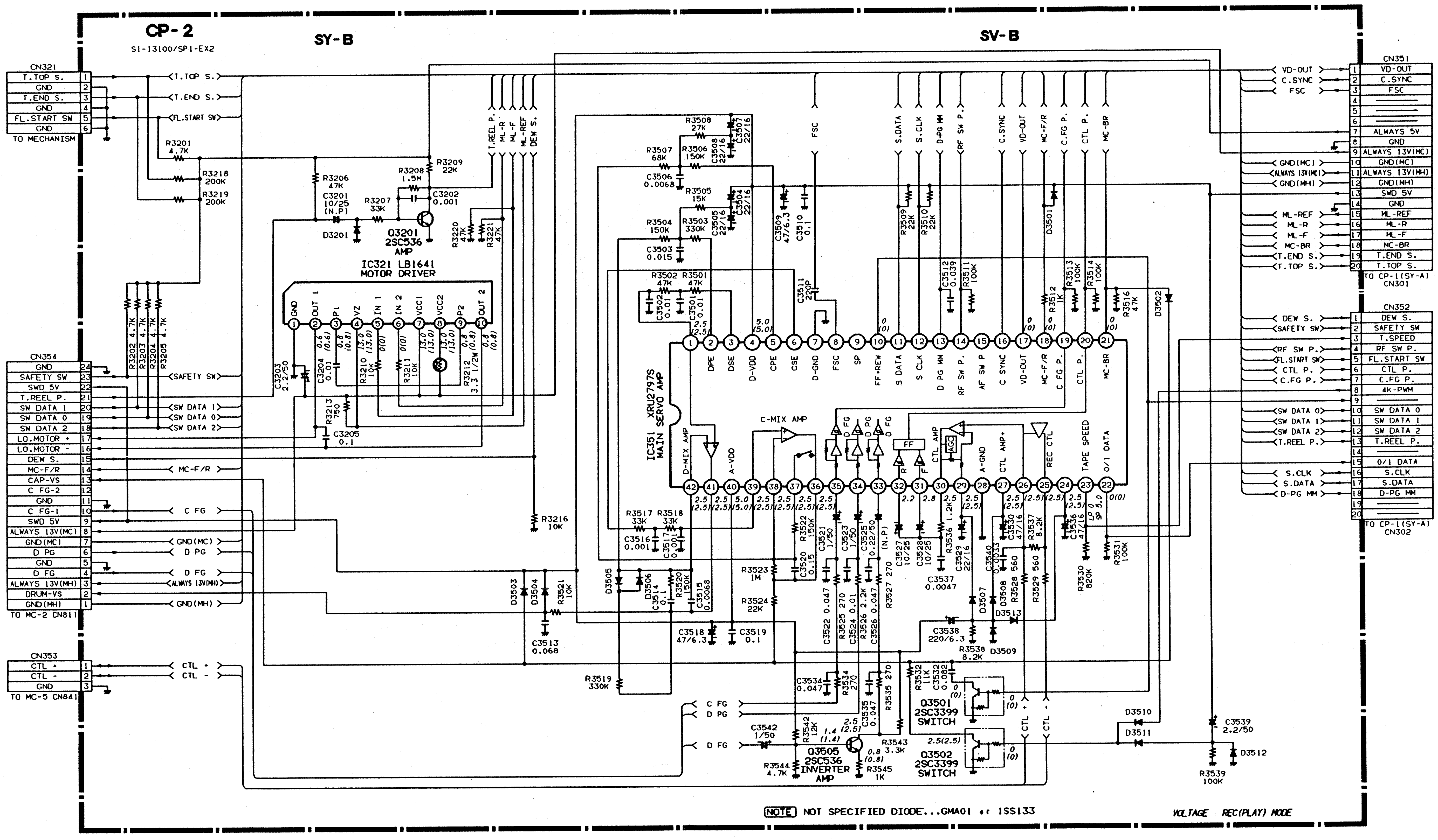
WAVEFORM OF SERVO



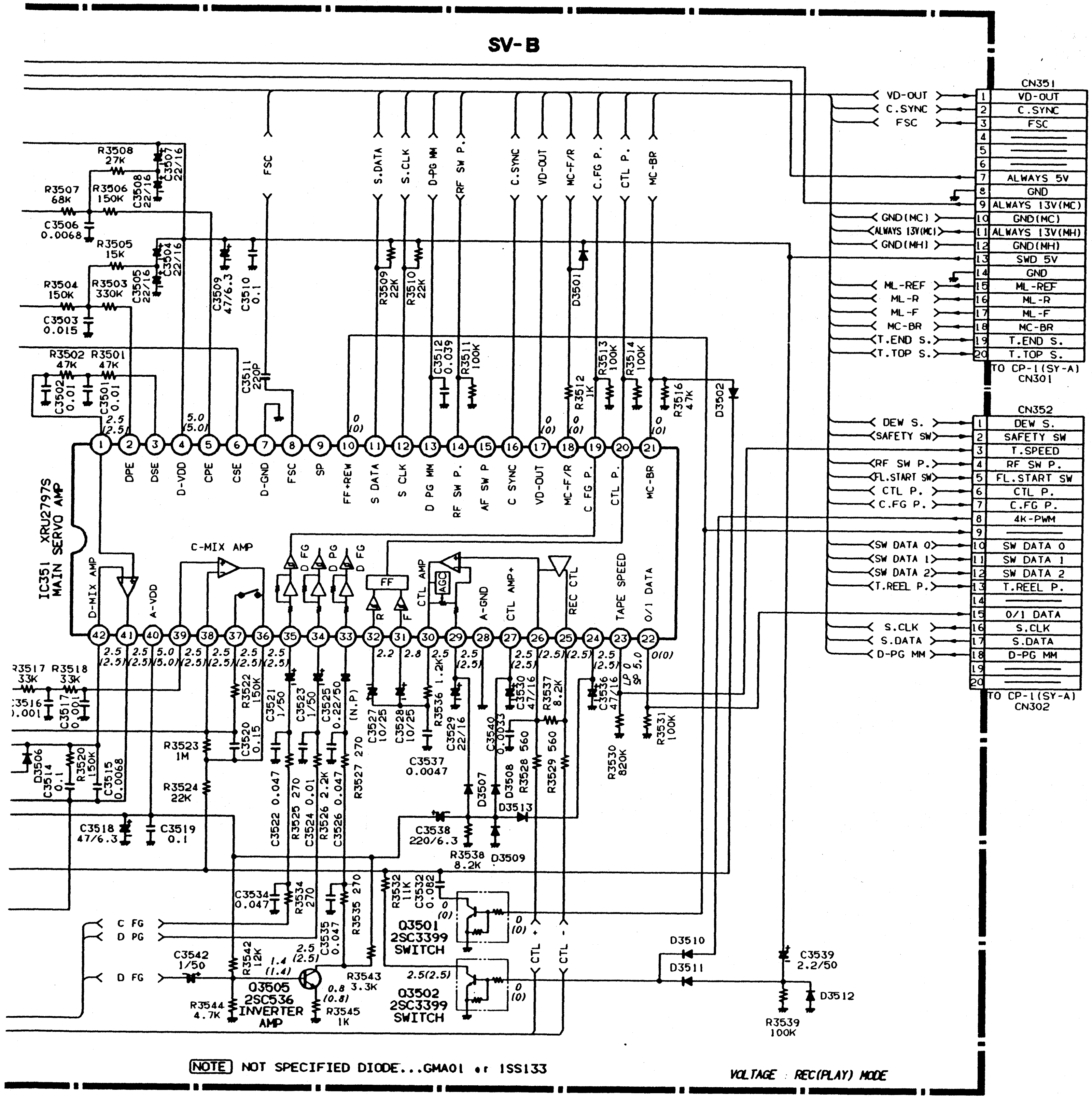
IC351 (XRU2797S)
② ③ ⑤ ⑥
5.0V
69.27KHz
⑧
1.0Vp-p
4.43MHz
⑬
2msec
2.5V
7msec
⑭
4.8V
20msec 20msec
⑯
3.7V
T = 20msec
⑲
5.0V
504Hz
⑳
REC
5V
24msec 16msec
⑳
P.B.
850μsec
5.0V
40msec
㉕
REC
3.6V
1.4V
24msec 16msec
㉖
REC
1.4V
3.6V
24msec 16msec
㉚
P.B.
1 3Vp-p
40 msec
㉝
40mVp-p
1.33 msec
㉞
250mV p-p
40msec
㉟
20mVp-p
1.98 msec

WF-S-SP1

CP-2 BOARD (SY-B, SV-B) SERVO CIRCUIT DIAGRAM


CP-2
S1-13100/SP1-EX2
SY-B
SV-B
CN321
T.TOP S.
GND
T.END S.
GND
FL.START SW
GND
TO MECHANISM
CN354
GND
SAFETY SW
SWD 5V
T.REEL P.
SW DATA 1
SW DATA 0
SW DATA 2
LO.MOTOR +
LO.MOTOR -
DEW S.
MC-F/R
CAP-VS
C FG-2
C FG-1
ALWAYS 13V(MC)
GND(MC)
D PG
D FG
ALWAYS 13V(MH)
DRUM-VS
GND(MH)
TO MC-2 CN811
CN353
CTL +
CTL -
TO MC-5 CN841
IC321 LB1641
MOTOR DRIVER
OUT 1
P1
VZ
IN 1
IN 2
VCC1
VCC2
P2
OUT 2
Q3201
2SC536
AMP
D3201
IC351 XRU2797S
MAIN SERVO AMP
DPE
DSE
D-VDD
CPE
CSE
D-GND
FSC
SP
FF-REW
S DATA
S CLK
D PG MM
RF SW P.
AF SW P
C SYNC
VD-OUT
MC-F/R
C FG P.
CTL P.
MC-BR
D-MIX AMP
A-VDD
C-MIX AMP
D FG
D PG
FF
CTL AMP
AGC
A-GND
CTL AMP+
REC CTL
TAPE SPEED
0/1 DATA
Q3501
2SC3399
SWITCH
Q3502
2SC3399
SWITCH
Q3505
2SC536
INVERTER
AMP
CN351
VD-OUT
C.SYNC
FSC
ALWAYS 5V
ALWAYS 13V(MC)
ALWAYS 13V(MH)
GND(MH)
SWD 5V
ML-REF
ML-R
ML-F
MC-BR
T.END S.
T.TOP S.
TO CP-1(SY-A)
CN301
CN352
DEW S.
SAFETY SW
T.SPEED
RF SW P.
FL.START SW
CTL P.
C.FG P.
4K-PWM
SW DATA 0
SW DATA 1
SW DATA 2
T.REEL P.
0/1 DATA
S.CLK
S.DATA
D-PG MM
TO CP-1(SY-A)
CN302
NOTE NOT SPECIFIED DIODE...GMA01 or 1SS133
VOLTAGE : REC(PLAY) MODE

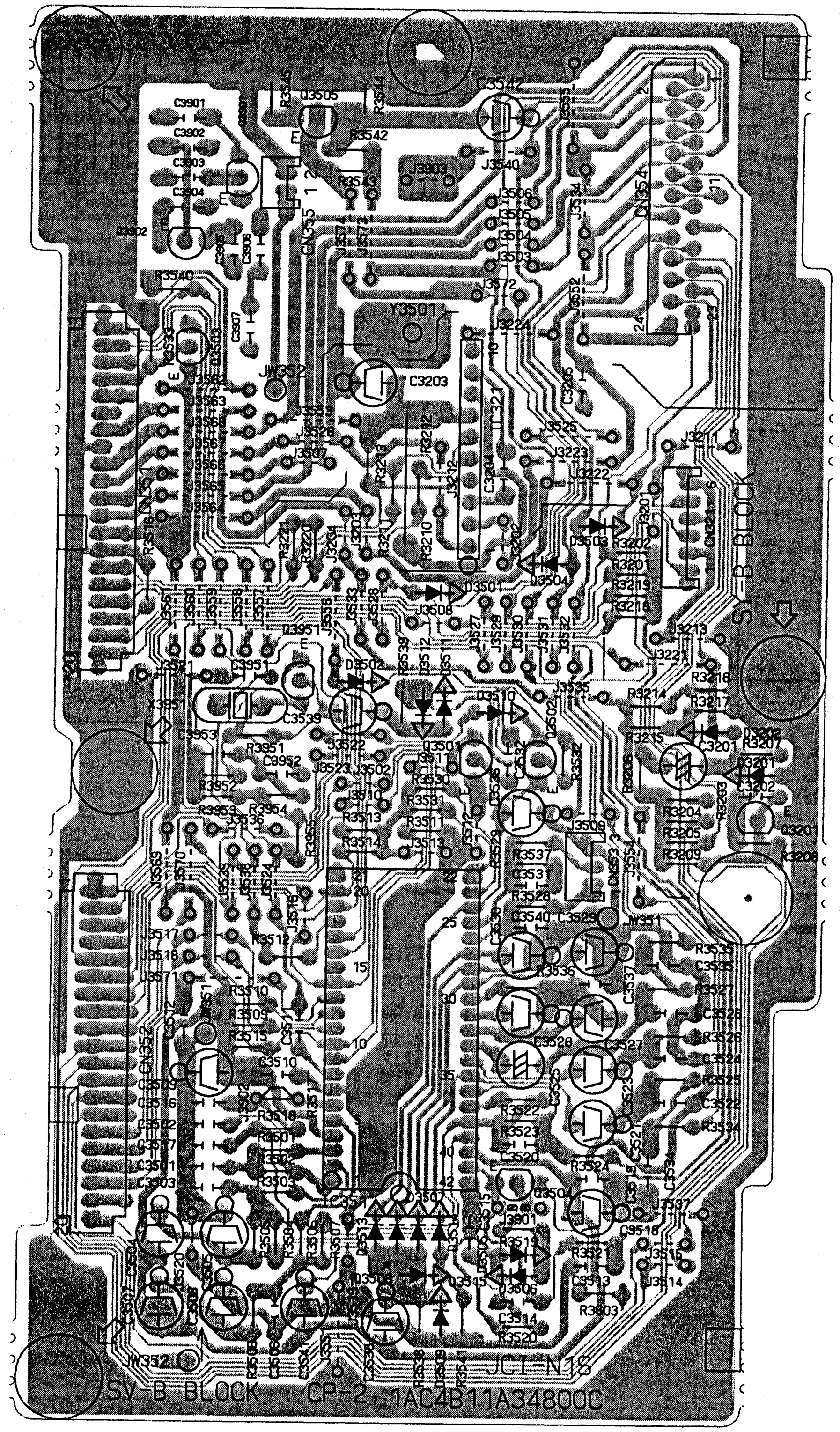
, SV-B) SERVO CIRCUIT DIAGRAM


SV-B
IC351 XRU2797S MAIN SERVO AMP
DPE
DSE
D-VDD
CPE
CSE
D-GND
FSC
SP
FF+REW
S DATA
S CLK
D PG MM
RF SW P.
AF SW P
C SYNC
VD-OUT
MC-F/R
C FG P.
CTL P.
MC-BR
D-MIX AMP
A-VDD
C-MIX AMP
D FG
D PG
C FG
FF
CTL AMP
AGC
A-GND
CTL AMP+
REC CTL
TAPE SPEED
0/1 DATA
Q3501 2SC3399 SWITCH
Q3502 2SC3399 SWITCH
Q3505 2SC536 INVERTER AMP
C FG
D PG
D FG
CTL +
CTL -
CN351
1 VD-OUT
2 C.SYNC
3 FSC
7 ALWAYS 5V
8 GND
9 ALWAYS 13V(MC)
10 GND(MC)
11 ALWAYS 13V(MH)
12 GND(MH)
13 SWD 5V
14 GND
15 ML-REF
16 ML-R
17 ML-F
18 MC-BR
19 T.END S.
20 T.TOP S.
TO CP-1(SY-A) CN301
CN352
1 DEW S.
2 SAFETY SW
3 T.SPEED
4 RF SW P.
5 FL.START SW
6 CTL P.
7 C.FG P.
8 4K-PWM
10 SW DATA 0
11 SW DATA 1
12 SW DATA 2
13 T.REEL P.
15 0/1 DATA
16 S.CLK
17 S.DATA
18 D-PG MM
TO CP-1(SY-A) CN302

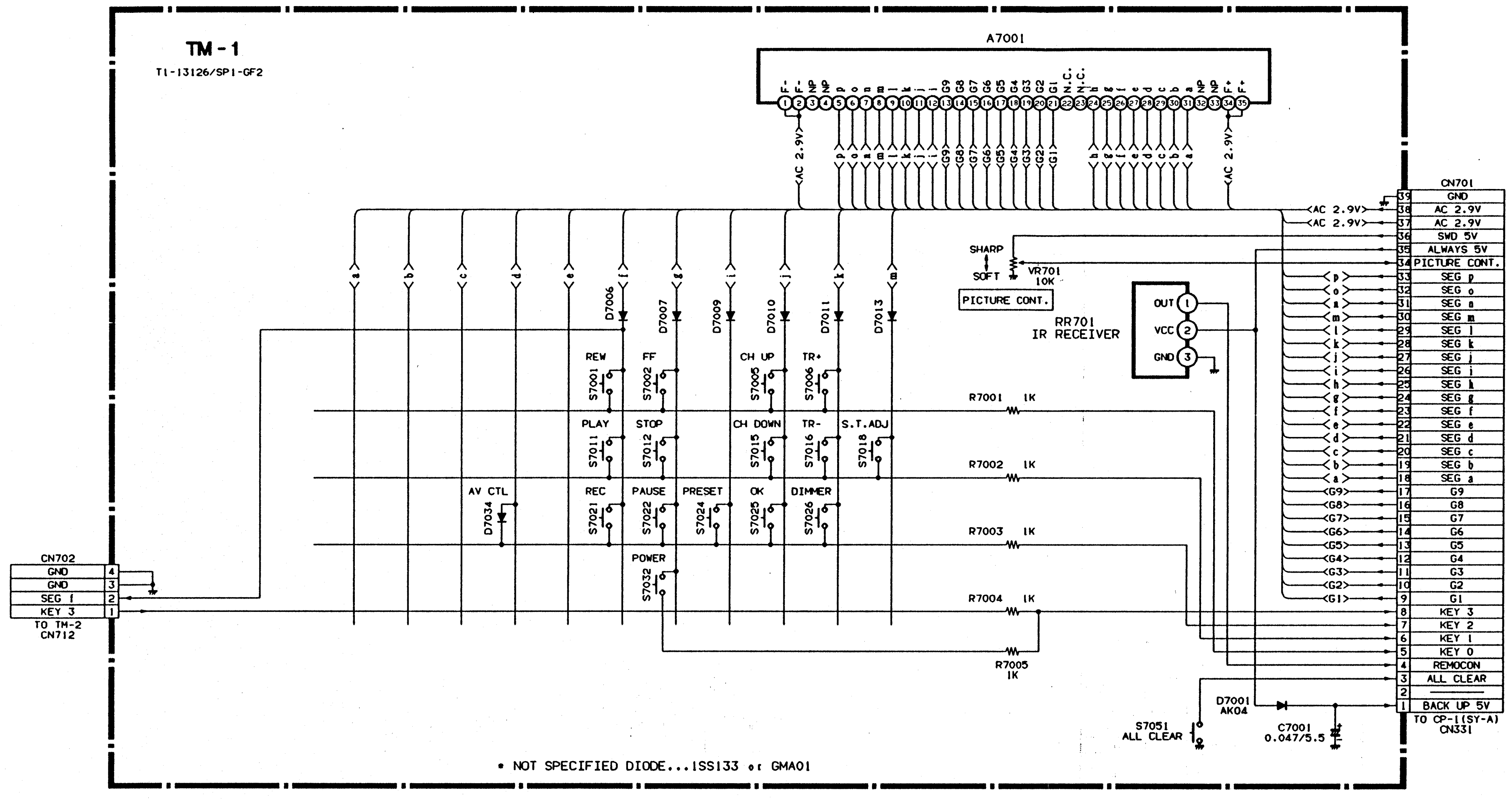
NOTE NOT SPECIFIED DIODE...GMA01 or 1SS133

VOLTAGE : REC(PLAY) MODE

CP-2 P.C.B.

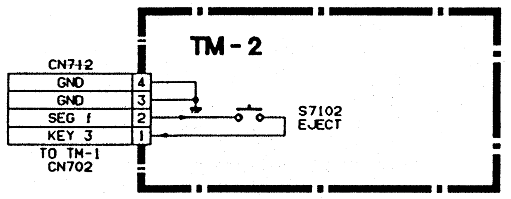

SV-B BLOCK
CP-2 1AC4B11A34800C
JC1 N1S
Y3501

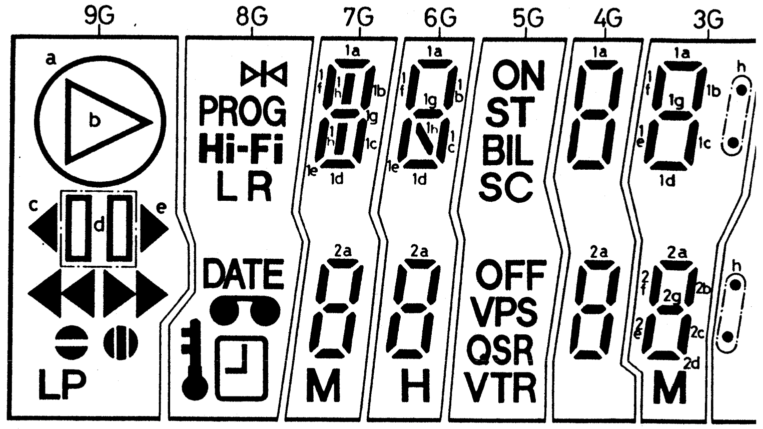
TM-1,2 BOARD OPERATION KEY & DISPLAY (FLD) CIRCUIT DIAGRAM


TM - 1
TI-13126/SP1-GF2
A7001
F- F- NP NP p o n m l k j i G9 G8 G7 G6 G5 G4 G3 G2 G1 N.C. N.C. h g f e d c b a NP NP F+ F+
<AC 2.9V>
SHARP
SOFT
VR701 10K
PICTURE CONT.
RR701 IR RECEIVER
OUT
VCC
GND
D7006
D7007
D7009
D7010
D7011
D7013
REW S7001
FF S7002
CH UP S7005
TR+ S7006
PLAY S7011
STOP S7012
CH DOWN S7015
TR- S7016
S.T.ADJ S7018
AV CTL D7034
REC S7021
PAUSE S7022
PRESET S7024
OK S7025
DIMMER S7026
POWER S7032
R7001 1K
R7002 1K
R7003 1K
R7004 1K
R7005 1K
D7001 AK04
C7001 0.047/5.5
S7051 ALL CLEAR
CN702
GND
GND
SEG f
KEY 3
TO TM-2 CN712
• NOT SPECIFIED DIODE...1SS133 or GMA01

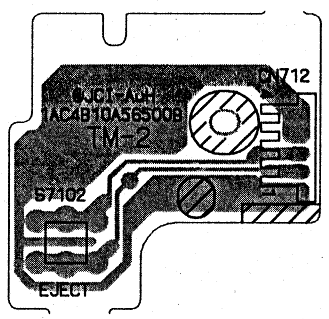
CN701 pin	Signal
39	GND
38	AC 2.9V
37	AC 2.9V
36	SWD 5V
35	ALWAYS 5V
34	PICTURE CONT.
33	SEG p
32	SEG o
31	SEG n
30	SEG m
29	SEG l
28	SEG k
27	SEG j
26	SEG i
25	SEG h
24	SEG g
23	SEG f
22	SEG e
21	SEG d
20	SEG c
19	SEG b
18	SEG a
17	G9
16	G8
15	G7
14	G6
13	G5
12	G4
11	G3
10	G2
9	G1
8	KEY 3
7	KEY 2
6	KEY 1
5	KEY 0
4	REMOCON
3	ALL CLEAR
2	———
1	BACK UP 5V

TO CP-1(SY-A) CN331

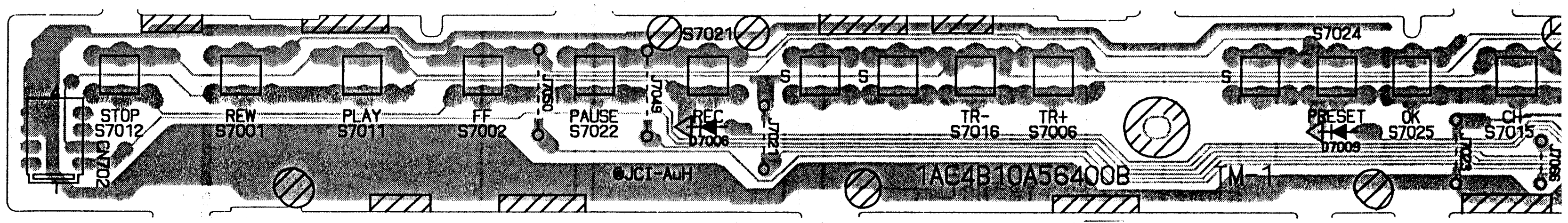

TM - 2
CN712
GND
GND
SEG f
KEY 3
TO TM-1 CN702
S7102 EJECT


9G
8G
7G
6G
5G
4G
3G
a
b
c
d
e
LP
PROG
Hi-Fi
L R
DATE
ON
ST
BIL
SC
OFF
VPS
QSR
VTR
M
H
M
1a 1b 1c 1d 1e 1g
2a 2b 2c 2d 2e 2f 2g
h

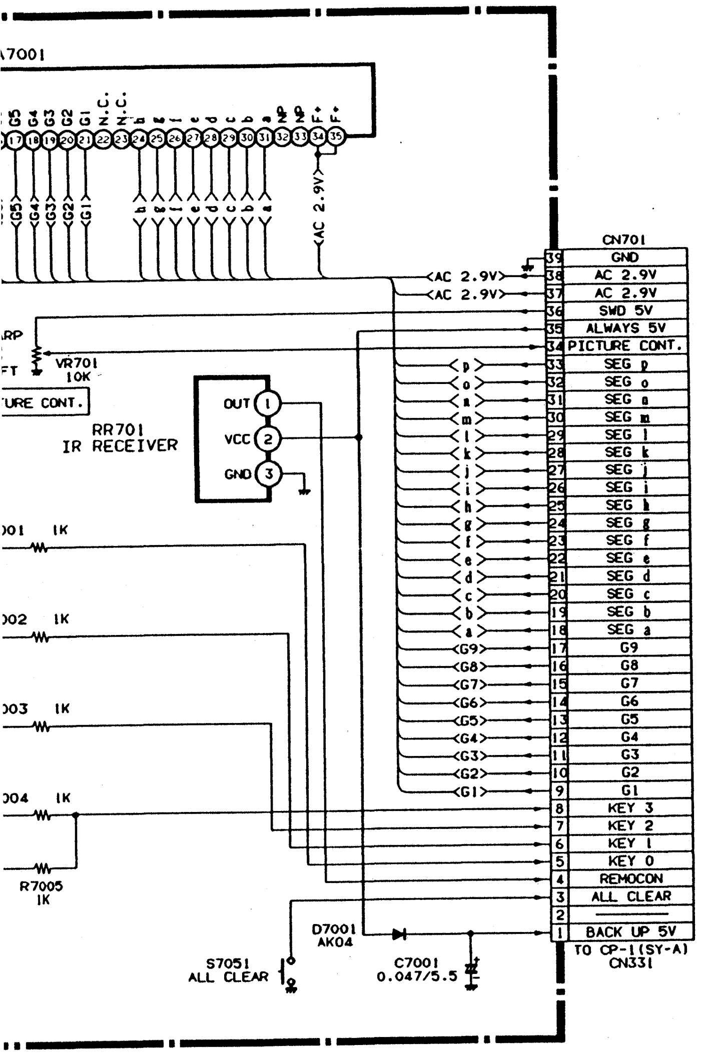
TM-2 P.C.B.


CN712
JC1-AuH
1AC4B10A56500B
TM-2
S7102
EJECT

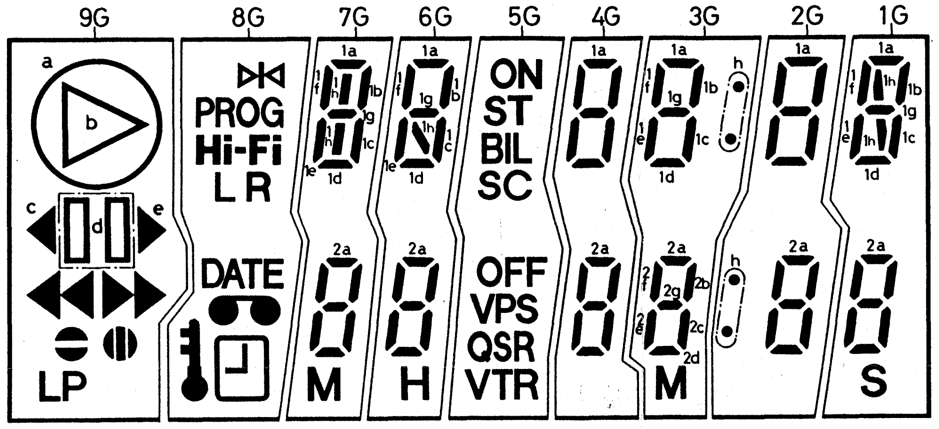
TM-1 P.C.B.


S7021
S7024
STOP S7012
REW S7001
PLAY S7011
FF S7002
PAUSE S7022
REC D7006
TR- S7016
TR+ S7006
PRESET D7009
OK S7025
CH S7015
CN702
JC1-AuH
1AC4B10A56400B
TM-1

UIT DIAGRAM


A7001
VR701 10K
PICTURE CONT.
RR701 IR RECEIVER
OUT
VCC
GND
R7005 1K
D7001 AK04
C7001 0.047/5.5
S7051 ALL CLEAR
CN701
39 GND
38 AC 2.9V
37 AC 2.9V
36 SWD 5V
35 ALWAYS 5V
34 PICTURE CONT.
33 SEG p
32 SEG o
31 SEG n
30 SEG m
29 SEG l
28 SEG k
27 SEG j
26 SEG i
25 SEG h
24 SEG g
23 SEG f
22 SEG e
21 SEG d
20 SEG c
19 SEG b
18 SEG a
17 G9
16 G8
15 G7
14 G6
13 G5
12 G4
11 G3
10 G2
9 G1
8 KEY 3
7 KEY 2
6 KEY 1
5 KEY 0
4 REMOCON
3 ALL CLEAR
2
1 BACK UP 5V
TO CP-1(SY-A) CN331

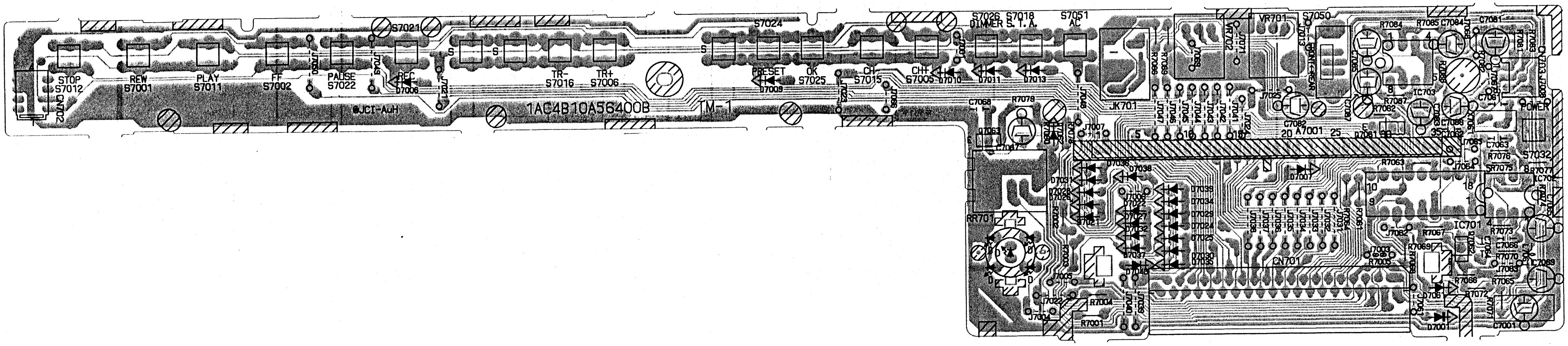
9G: GRAPHIC MODE DISPLAY


9G
8G
7G
6G
5G
4G
3G
2G
1G
a
b
c
d
e
PROG
Hi-Fi
L R
DATE
LP
M
H
ON
ST
BIL
SC
OFF
VPS
QSR
VTR
M
S

	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	○	¤	1a	1a	**ON**	1a	1a	1a	1a
b	▷	⧓	1b	1b	**ST**	1b	1b	1b	1b
c	◀	**PROG**	1c	1c	**BIL**	1c	1c	1c	1c
d	▯▯	**Hi-Fi**	1d	1d	**SC**	1d	1d	1d	1d
e	▶	**L**	1e	1e	–	1e	1e	1e	1e
f	–	**R**	1f	1f	–	1f	1f	1f	1f
g	–	–	1g	1g	–	1g	1g	1g	1g
h	–	–	1h	1h	–	–	:(UPPER)	:(LOWER)	1h
i	◀◀	**DATE**	2a	2a	**OFF**	2a	2a	2a	2a
j	▶▶	● ●	2b	2b	**VPS**	2b	2b	2b	2b
k	⊖	🌡	2c	2c	**QSR**	2c	2c	2c	2c
l	◍	◲	2d	2d	**VTR**	2d	2d	2d	2d
m	**LP**	–	2e	2e	–	2e	2e	2e	2e
n	**EP**	–	2f	2f	–	2f	2f	2f	2f
o	–	–	2g	2g	–	2g	2g	2g	2g
p	–	–	**M**	**H**	–	**H**	**M**	**M**	**S**

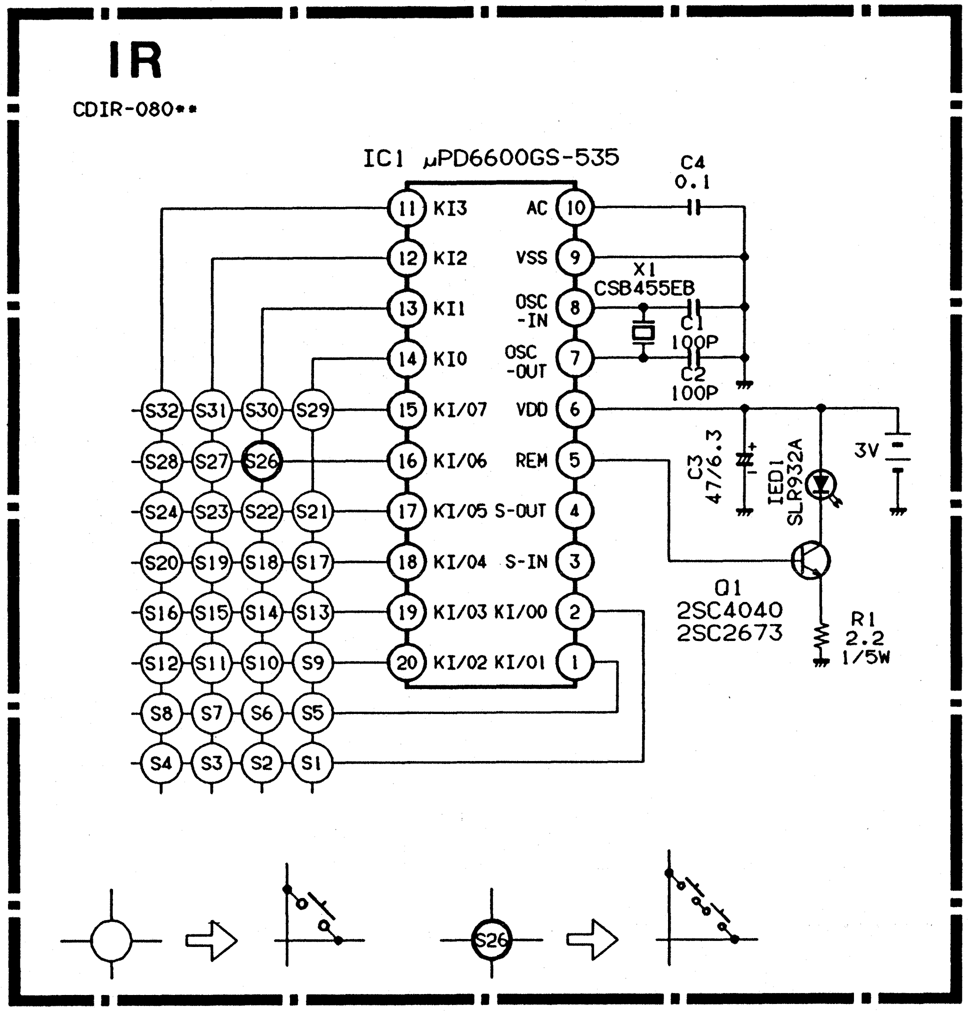
9G/QP

TM-1 P.C.B.


STOP S7012
REW S7001
PLAY S7011
FF S7002
PAUSE S7022
REC S7021
TR- S7016
TR+ S7006
PRESET S7009
OK S7025
S7024
CH- S7015
CH+ S7005
S7026 DIMMER
S7018 S.T.A.
S7051 AC
VR701
S7050
CN702
1AC4B10A56400B
TM-1
JK701
RR701
IC701
IC703
CN701
A7001
POWER
S7032
C7001
D7001

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 2

IR REMOTE CONTROL CIRCUIT DIAGRAM

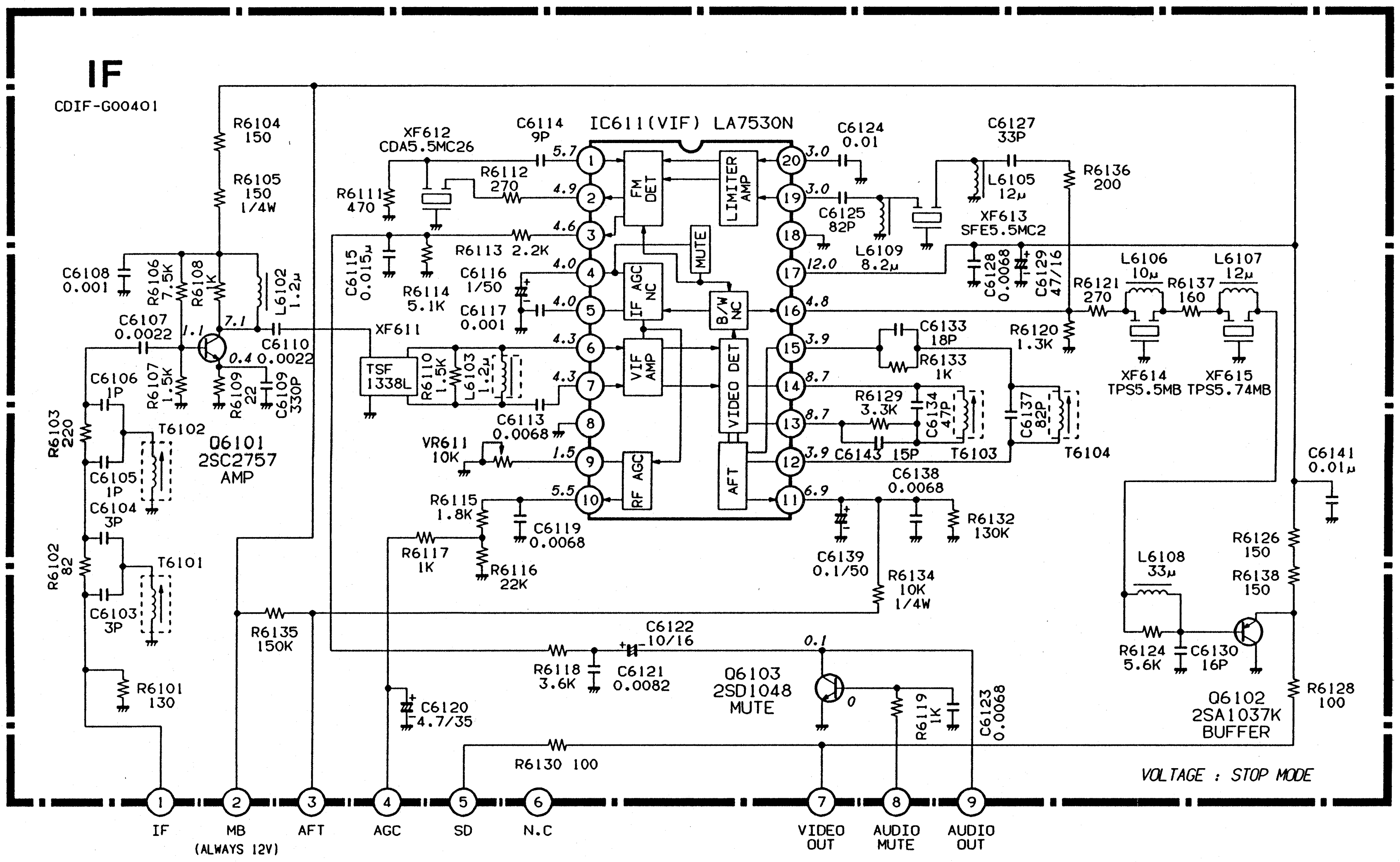

IR
CDIR-080••
IC1 μPD6600GS-535
KI3
KI2
KI1
KI0
KI/07
KI/06
KI/05
KI/04
KI/03
KI/02
AC
VSS
OSC -IN
OSC -OUT
VDD
REM
S-OUT
S-IN
KI/00
KI/01
C4 0.1
X1 CSB455EB
C1 100P
C2 100P
C3 47/6.3
IED1 SLR932A
3V
Q1 2SC4040 2SC2673
R1 2.2 1/5W
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S26 S27 S28 S29 S30 S31 S32
S26

AVAILABLE KEY FUNCTION OF REMOTE CONTROL UNIT

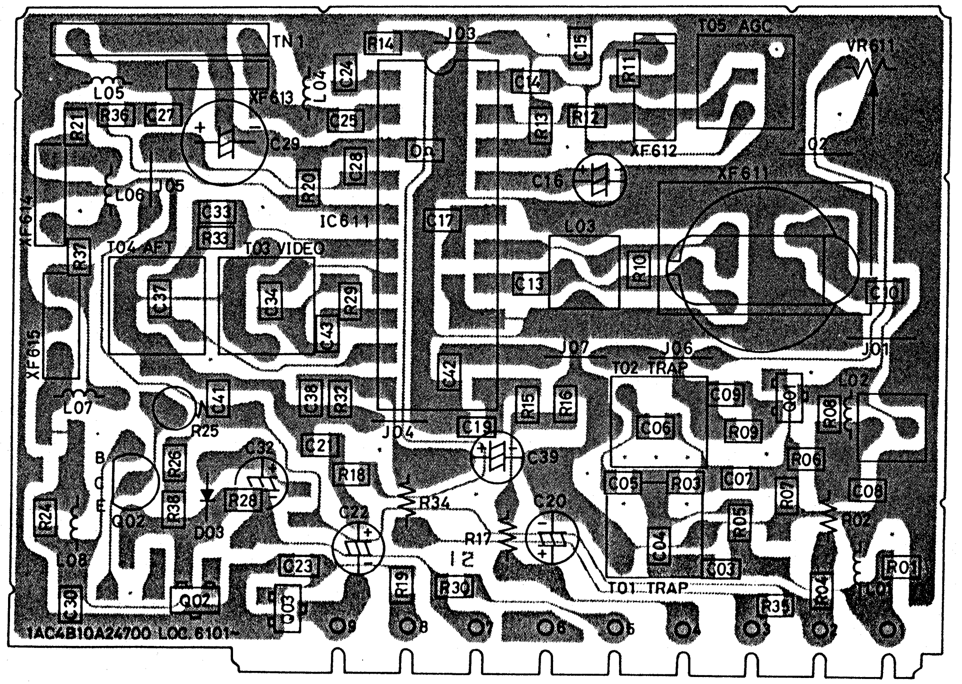
KEY NO	FUNCTION	
S1	POWER	USE
S2	VTR/TV	
S3	MONITOR	USE
S4	SP/LP	
S5	CLOCK	USE
S6	1	USE
S7	2	USE
S8	3	USE
S9	PROG	USE
S10	4	USE
S11	5	USE
S12	6	USE
S13	CANCEL	USE
S14	7	USE
S15	8	USE
S16	9	USE
S17	VPS	USE
S18	⇤	USE
S19	0/AV	USE
S20	⇥	USE
S21	A.TRACK	USE
S22	REW	USE
S23	PLAY	USE
S24	FF	USE
S26	REC	USE
S27	STOP	USE
S28	PAUSE/STILL	USE
S29	🔑 (SPECIAL)	USE
S30	INDEX	USE
S31	RESET	USE
S32	MEMORY	USE

IR-08001

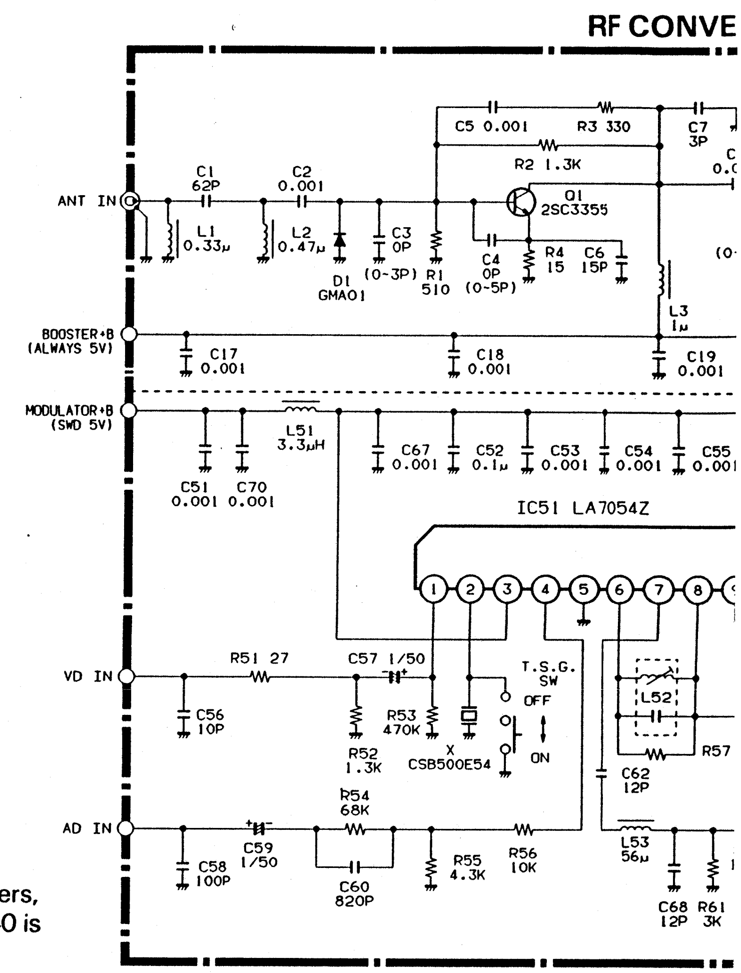
IF CIRCUIT DIAGRAM


IF
CDIF-G00401
IC611(VIF) LA7530N
FM DET
LIMITER AMP
MUTE
IF AGC NC
B/W NC
VIF AMP
VIDEO DET
RF AGC
AFT
XF612 CDA5.5MC26
XF613 SFE5.5MC2
XF611
TSF 1338L
XF614 TPS5.5MB
XF615 TPS5.74MB
Q6101 2SC2757 AMP
Q6102 2SA1037K BUFFER
Q6103 2SD1048 MUTE
T6101
T6102
T6103
T6104
R6104 150
R6105 150 1/4W
R6106 7.5K
R6108 1K
L6102 1.2µ
C6108 0.001
C6107 0.0022
C6110 0.0022
R6109 22
C6109 330P
R6107 1.5K
C6106 1P
R6103 220
C6105 1P
C6104 3P
R6102 82
C6103 3P
R6101 130
R6111 470
R6112 270
C6114 9P
C6115 0.015µ
R6113 2.2K
R6114 5.1K
C6116 1/50
C6117 0.001
R6110 1.5K
L6103 1.2µ
C6113 0.0068
VR611 10K
R6115 1.8K
C6119 0.0068
R6117 1K
R6116 22K
C6124 0.01
C6125 82P
L6109 8.2µ
C6127 33P
L6105 12µ
R6136 200
C6128 0.0068
C6129 47/16
L6106 10µ
L6107 12µ
R6121 270
R6137 160
R6120 1.3K
C6133 18P
R6133 1K
R6129 3.3K
C6134 47P
C6137 82P
C6143 15P
C6138 0.0068
R6132 130K
C6139 0.1/50
R6134 10K 1/4W
C6141 0.01µ
R6126 150
R6138 150
L6108 33µ
R6124 5.6K
C6130 16P
R6128 100
R6135 150K
C6122 10/16
R6118 3.6K
C6121 0.0082
C6120 4.7/35
R6119 1K
C6123 0.0068
R6130 100
VOLTAGE : STOP MODE
① IF
② MB (ALWAYS 12V)
③ AFT
④ AGC
⑤ SD
⑥ N.C
⑦ VIDEO OUT
⑧ AUDIO MUTE
⑨ AUDIO OUT

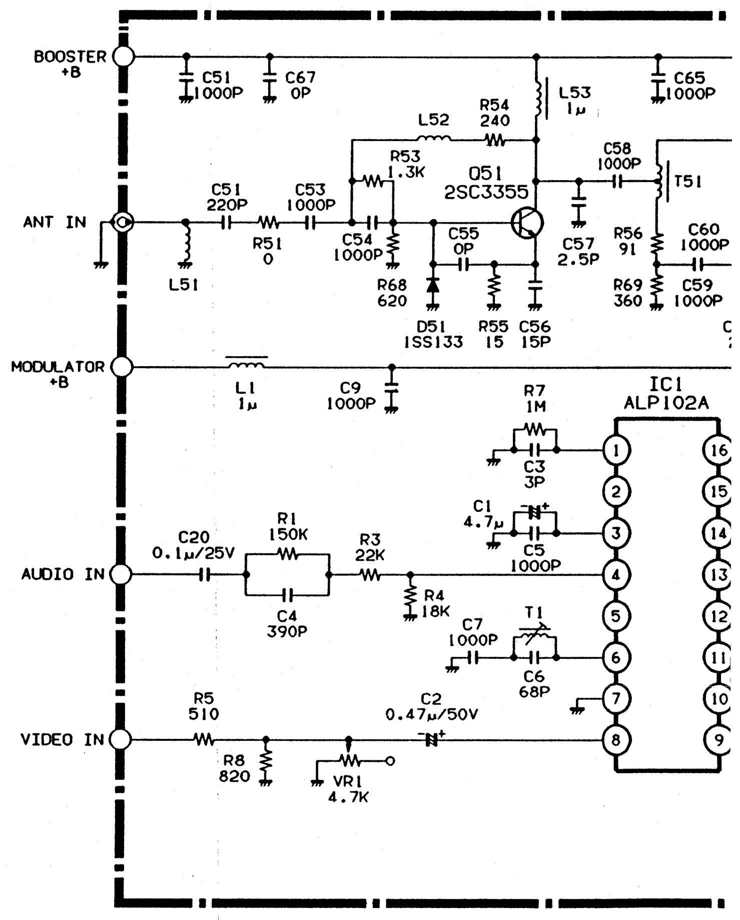
IF P.C.B.

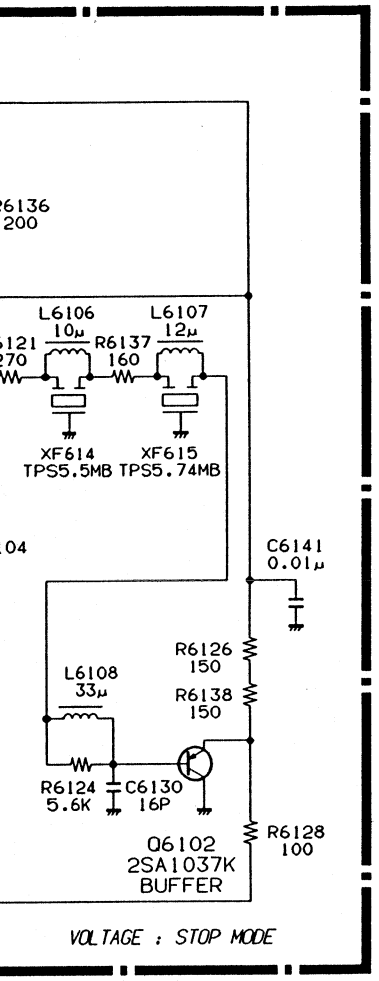

TN1
L05
XF613
C29
IC611
XF612
XF611
VR611
T05 AGC
T04 AFT
T03 VIDEO
T02 TRAP
T01 TRAP
XF614
XF615
L06
L07
L08
Q01
Q02
Q03
1AC4B10A24700 LOC.6101

RF CONVE

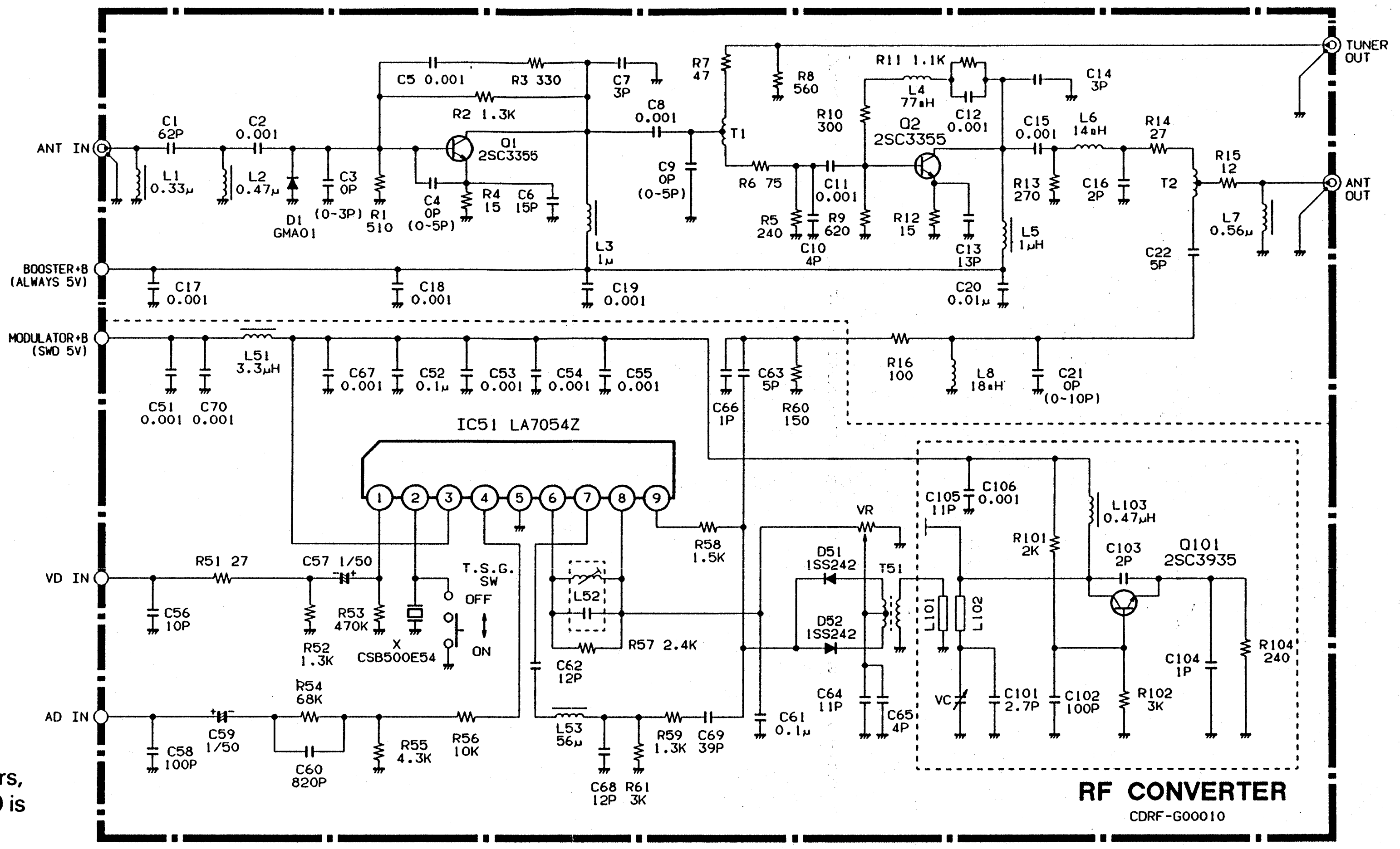

ANT IN
BOOSTER+B (ALWAYS 5V)
MODULATOR+B (SWD 5V)
VD IN
AD IN
C1 62P
L1 0.33µ
C2 0.001
L2 0.47µ
D1 GMA01
C3 0P (0-3P)
R1 510
C4 0P (0-5P)
C5 0.001
R3 330
R2 1.3K
Q1 2SC3355
R4 15
C6 15P
C7 3P
L3 1µ
C17 0.001
C18 0.001
C19 0.001
L51 3.3µH
C67 0.001
C52 0.1µ
C53 0.001
C54 0.001
C55 0.001
C51 0.001
C70 0.001
IC51 LA7054Z
R51 27
C57 1/50
T.S.G. SW
OFF
ON
C56 10P
R53 470K
R52 1.3K
X CSB500E54
L52
R57
C62 12P
R54 68K
C59 1/50
C58 100P
C60 820P
R55 4.3K
R56 10K
L53 56µ
C68 12P
R61 3K

Note: Either one of these RF converters, type CDRF-G00010 or CDRF-G00740 is used, depending on availability.

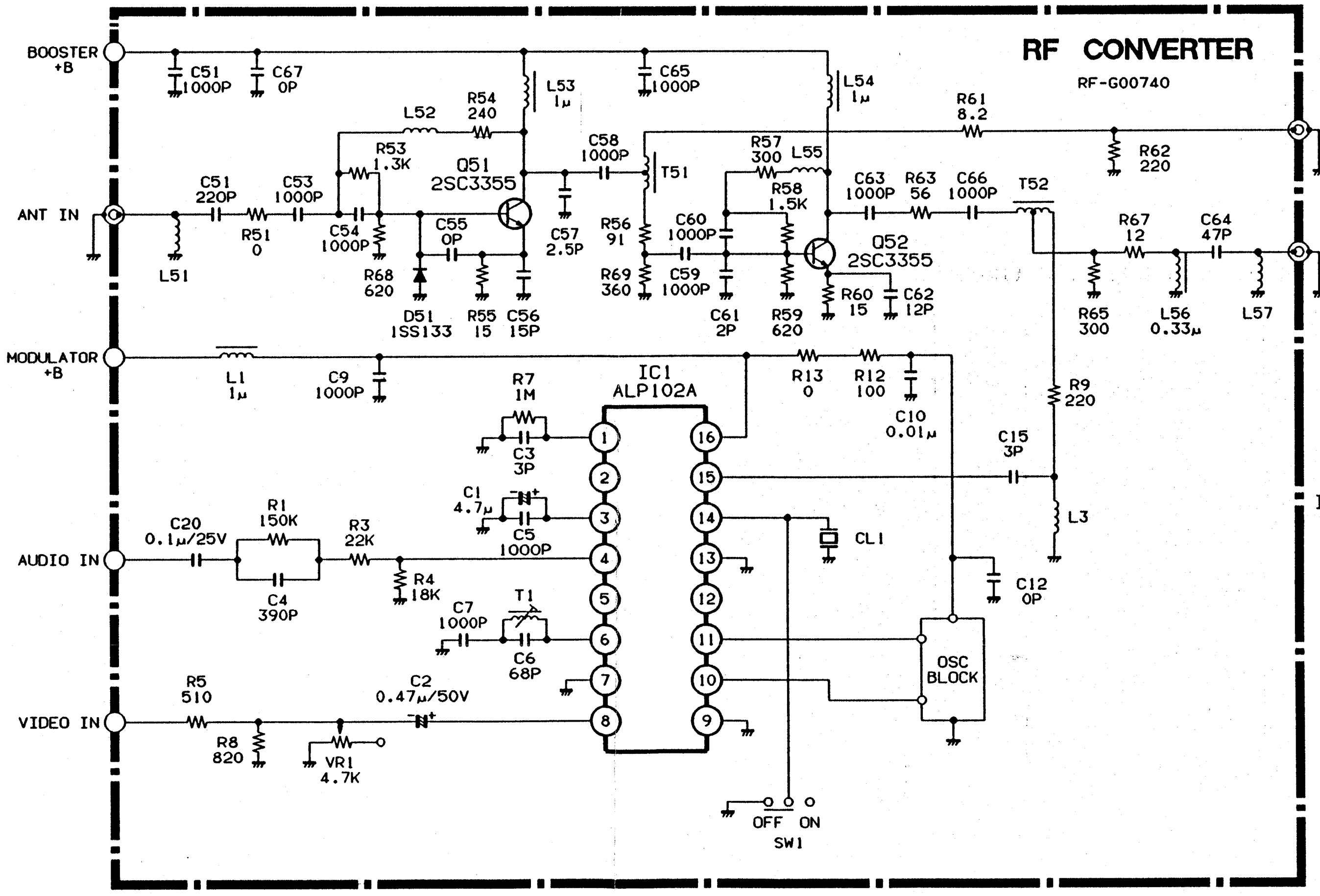

BOOSTER +B
ANT IN
MODULATOR +B
AUDIO IN
VIDEO IN
C51 1000P
C67 0P
L53 1µ
C65 1000P
L52
R54 240
R53 1.3K
Q51 2SC3355
C58 1000P
T51
C51 220P
R51 0
C53 1000P
C54 1000P
C55 0P
L51
R68 620
D51 1SS133
R55 15
C56 15P
C57 2.5P
R56 91
C60 1000P
R69 360
C59 1000P
L1 1µ
C9 1000P
R7 1M
IC1 ALP102A
C3 3P
C1 4.7µ
C5 1000P
C20 0.1µ/25V
R1 150K
R3 22K
R4 18K
C4 390P
C7 1000P
T1
C6 68P
R5 510
R8 820
VR1 4.7K
C2 0.47µ/50V

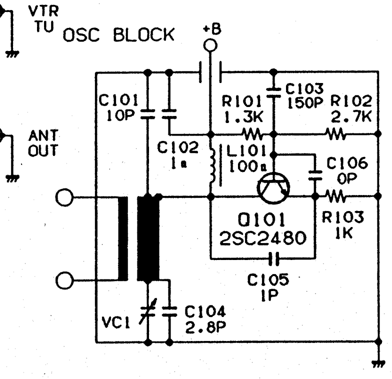

6136
200
L6106
10μ
L6107
12μ
121
270
R6137
160
XF614
TPS5.5MB
XF615
TPS5.74MB
04
C6141
0.01μ
R6126
150
L6108
33μ
R6138
150
R6124
5.6K
C6130
16P
Q6102
2SA1037K
BUFFER
R6128
100
VOLTAGE : STOP MODE

RF CONVERTER CIRCUIT DIAGRAM

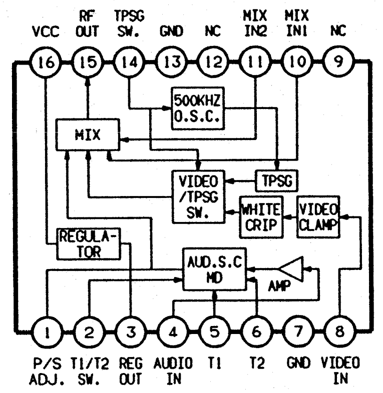

ANT IN
BOOSTER+B (ALWAYS 5V)
MODULATOR+B (SWD 5V)
VD IN
AD IN
TUNER OUT
ANT OUT
C1 62P
C2 0.001
C5 0.001
R3 330
R2 1.3K
Q1 2SC3355
L1 0.33μ
L2 0.47μ
D1 GMA01
C3 0P (0-3P)
R1 510
C4 0P (0-5P)
R4 15
C6 15P
C7 3P
C8 0.001
C9 0P (0-5P)
L3 1μ
R7 47
R8 560
R10 300
T1
R11 1.1K
L4 77nH
C12 0.001
Q2 2SC3355
R6 75
C11 0.001
R5 240
R9 620
C10 4P
R12 15
C13 13P
C14 3P
C15 0.001
L6 14nH
R14 27
R13 270
C16 2P
L5 1μH
T2
R15 12
L7 0.56μ
C22 5P
C17 0.001
C18 0.001
C19 0.001
C20 0.01μ
C51 0.001
C70 0.001
L51 3.3μH
C67 0.001
C52 0.1μ
C53 0.001
C54 0.001
C55 0.001
C66 1P
C63 5P
R60 150
R16 100
L8 18nH
C21 0P (0-10P)
IC51 LA7054Z
R51 27
C56 10P
C57 1/50
R53 470K
R52 1.3K
X CSB500E54
T.S.G. SW
OFF
ON
L52
R57 2.4K
C62 12P
R58 1.5K
VR
D51 1SS242
D52 1SS242
T51
C64 11P
C65 4P
C61 0.1μ
R54 68K
C58 100P
C59 1/50
C60 820P
R55 4.3K
R56 10K
L53 56μ
C68 12P
R61 3K
R59 1.3K
C69 39P
C105 11P
C106 0.001
L103 0.47μH
R101 2K
C103 2P
Q101 2SC3935
L101
L102
VC
C101 2.7P
C102 100P
R102 3K
C104 1P
R104 240
RF CONVERTER
CDRF-G00010

Note: Either one of these RF converters, type CDRF-G00010 or CDRF-G00740 is used, depending on availability.


RF CONVERTER
RF-G00740
BOOSTER +B
ANT IN
MODULATOR +B
AUDIO IN
VIDEO IN
VTR TU
ANT OUT
C51 1000P
C67 0P
L53 1μ
C65 1000P
L54 1μ
R61 8.2
R62 220
L52
R54 240
R53 1.3K
Q51 2SC3355
C58 1000P
T51
R57 300
L55
R58 1.5K
C51 220P
C53 1000P
R51 0
C54 1000P
C55 0P
L51
R68 620
D51 1SS133
R55 15
C56 15P
C57 2.5P
R56 91
C60 1000P
R69 360
C59 1000P
C61 2P
R59 620
Q52 2SC3355
R60 15
C62 12P
C63 1000P
R63 56
C66 1000P
T52
R67 12
C64 47P
R65 300
L56 0.33μ
L57
L1 1μ
C9 1000P
R7 1M
C3 3P
IC1 ALP102A
R13 0
R12 100
C10 0.01μ
R9 220
C15 3P
L3
C1 4.7μ
C5 1000P
CL1
C20 0.1μ/25V
R1 150K
C4 390P
R3 22K
R4 18K
C7 1000P
T1
C6 68P
C12 0P
OSC BLOCK
R5 510
R8 820
VR1 4.7K
C2 0.47μ/50V
OFF ON
SW1


OSC BLOCK
+B
C101 10P
C102 1μ
R101 1.3K
C103 150P
R102 2.7K
L101 100n
C106 0P
Q101 2SC2480
R103 1K
C105 1P
VC1
C104 2.8P

IC1 BLOCK DIAGRAM


VCC
RF OUT
TPSG SW.
GND
NC
MIX IN2
MIX IN1
NC
500KHZ O.S.C.
MIX
TPSG
VIDEO /TPSG SW.
WHITE CRIP
VIDEO CLAMP
REGULA-TOR
AUD.S.C MD
AMP
P/S ADJ.
T1/T2 SW.
REG OUT
AUDIO IN
T1
T2
GND
VIDEO IN

IC301 SYSTEM CONTROL/TIMER/TUNING CONTROL MPU PIN FUNCTION TABLE

No.	Name	I/O	I/O Signal Function
1	T.END S.	I	Sensor signal input for tape end detection.
2	AV REF	I	Reference voltage input for internal A/D converter.
3	A-VDD	-	Power supply terminal for internal A/D converter.
4	VDD	-	IC power supply terminal.(5Vdc)
5	VDD	-	IC power supply terminal.(5Vdc)
6	X2	-	IC clock OSC terminal. Frequency is 6MHz.
7	X1	-	
8	IC	-	IC ground terminal.
9	XT2	-	Clock OSC for when power failure condition. Frequency is 32.672kHz.
10	XT1	-	
11	VSS	-	Ground terminal
12	AFT MUTE	O	"H" output during TU AFT mute.
13	VD MUTE	O	"H" output during TU video mute.
14	AD MUTE	O	"H" output during TU audio mute.
15	MC-BR	O	Brake signal for capstan motor.
16	ML-F	O	Loading motor rotation direction (FWD) indication signal.
17	ML-R	O	Loading motor rotation direction (REV) indication signal.
18	ML-L	O	Loading motor rotation speed (low speed) indication signal.
19	ML-M	O	Loading motor rotation speed (medium speed) indication signal.
20	SEG p	O	Display segment outputs (FLD). (Included key-scan output)
21	SEG o	O	
22	SEG n	O	
23	SEG m	O	
24	SEG l	O	
25	SEG k	O	
26	SEG j	O	
27	SEG i	O	
28	SEG h	O	
29	SEG g	O	
30	VDD	-	IC power supply input.(5Vdc)
31	V LOAD	O	-23V input for FLD drive.
32	SEG f	O	Display segment outputs (FLD). (Incloded key-scan output)
33	SEG e	O	
34	SEG d	O	
35	SEG c	O	
36	SEG b	O	
37	SEG a	O	
38	-	-	
39	G9	O	Display grid outputs (FLD).
40	G8	O	
41	G7	O	
42	G6	O	
43	G5	O	
44	G4	O	
45	G3	O	
46	G2	O	
47	G1	O	
48	VDD	-	IC power supply input.(5Vdc)
49	0/1 DATA	I	CTL pulse duty detection signal input. Used for VISS detection.
50	SV S DATA	O	Output 8-bit X 4 serial data giving operation mode and tracking data,etc., to digital servo IC.
51	SV S CLK	O	CLK is its clock pulse.
52	PWM	O	Tuning voltage output (PWM signal).
53	KEY IN 3	I	Operation key data inputs.
54	KEY IN 2	I	
55	KEY IN 1	I	
56	KEY IN 0	I	
57	I2C SDA	I/O	Data exchange with the VPS decoder IC.
58	DOC P	I	Drop out detection pulse input. Used for absorbing STILL noise.
59	BAND1	O	Tuning band data output(BAND1,BAND2).
60	BAND2	O	(L,L)=VHF-LOW (L,H)=VHF-HIGH (H,L)=UHF (H,H)=SKIP
61	E2PROM CS	O	E2PROM access (enable) signal output.
62	CH+	O	CH+ control signal output.
63	BLUE BACK ON	O	Blue back ON/OFF indicating signal output to OSD IC.
64	OSA CS	O	Chip enable (access) signsl output to OSD IC.
65	VSS	-	IC ground terminal.
66	T.REEL P.	I	Pulse input for detection of take-up reel table rotation.
67	SW DATA 2	I	3-bit data indicating operation position of mechanism.
68	SW DATA 1	I	
69	SW DATA 0	I	
70	PB H	O	Signal indicating playback mode.
71	AD MUTE	O	Signal disable audio signal output.
72	REC H	O	Signal indicating recording mode.
73	DOC OFF	O	Drop out pulse width selection signal output to DOC detection circuit.
74	INPUT SEL.	O	Signal for selecting video/audio input signal.
75	AV CTL	O	AV terminal (pin8 of 21pin AV socket) control signal output.
76	POWER UP	O	"HIGH" output except when power is off. Indicating that power is ON.
77	4k-PWM	O	Output 4kHz PWM signal for set period at start of high-speed FF/REW.
78	H.SYNC	I	Sync. detection signal input for existing channel discrimination.
79	C-FG P.	I	FG signal input of capstan motor.
80	CTL P.	I	CTL head recording/playback pulse signal input.
81	REMOCON	I	Remote control signal input.
82	FL-START SW	I	Switch input indicating start of cassette loading or discharge by cassette mechanism.
83	COMMON DATA	I/O	Terminal for communication of respective data with E2PROM IC, OSD IC and tuning PLL IC.
84	COMMON CLK	O	The clock pulse is output from this microprocessor.
85	RF SW P.	I	Input of RF switching pulse created by head drum PG.
86	RESET	-	Initial reset terminal for this IC.
87	A-VSS	-	Ground terminal for internal A/D converter.
88	POWER DOWN	I	Power failure detection terminal.
89	TAPE SPEED	I	Input of result of tape speed discrimination by digital servo IC.
90	ENV.	I	Video head envelope detection signal input for ATR function.
91	SAFETY SW	I	Input terminal for accidental erasur prevention switch. No operation to recording mode while "LOW" is input.
92	AFT-C	I	Tuner AFT s-curve signal input for tuner AFT function.
93	DEW S.	I	Dew sensor input terminal.
94	T.TOP S.	I	Sensor signal input for tape beginning detection.

SP1EV-OS

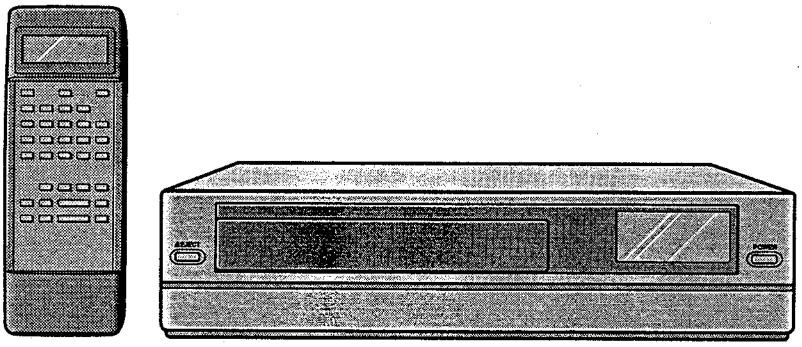
SERVICE MANUAL

FISHER

FVH-P1100 series
FVH-P1200 series
FVH-P1250S
FVH-P1340HV

Video Cassette Recorder

VHS PAL HQ



FVH-P1200HV

CONTENTS

1. CIRCUIT BOARD LOCATIONS

1-1. MAIN BOARDS 1
1-2. LOCATION FOR TAPE PATH ADJUSTMENT 1

2. ELECTRICAL ADJUSTMENT

2-1. PREPARATION 2
2-2. SERVO CIRCUIT ADJUSTMENT 4
2-3. VIDEO CIRCUIT ADJUSTMENT 5
2-4. VIDEO TEXT DECODER CIRCUIT ADJUSTMENT 7
2-5. AUDIO CIRCUIT ADJUSTMENT 8
2-6. TUNER IF CIRCUIT ADJUSTMENT 8

3. DISASSEMBLY PROCEDURES

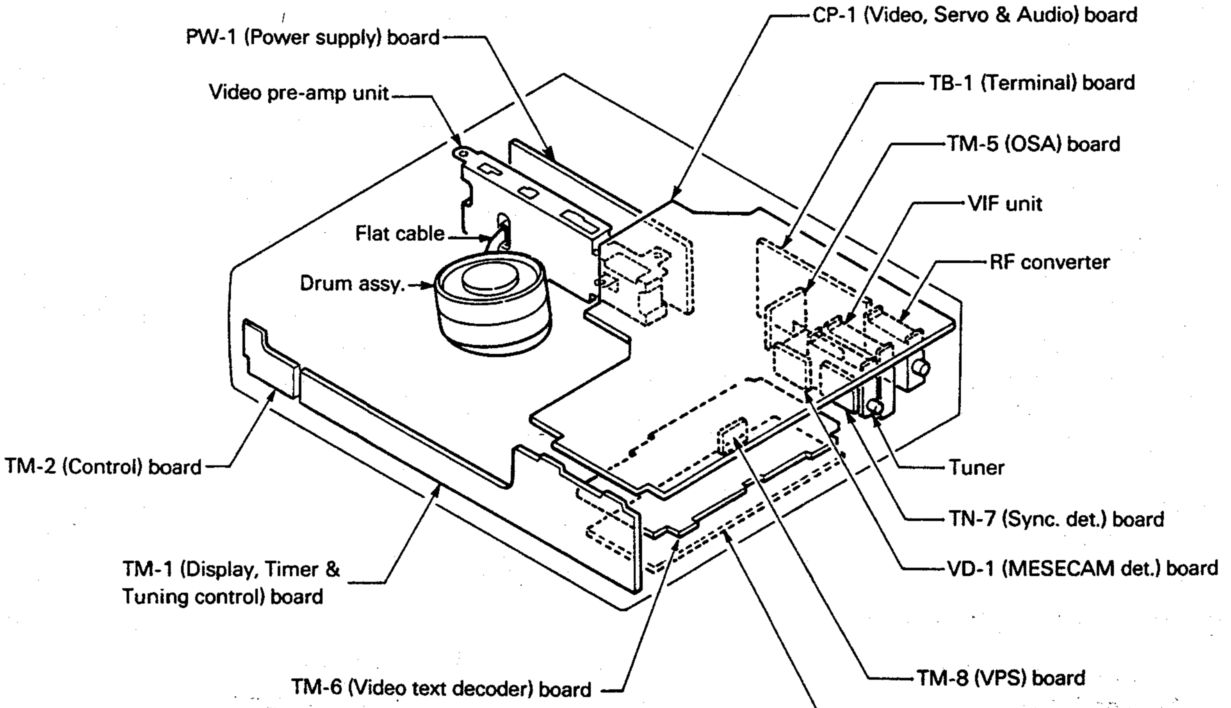
3-1. REMOVAL OF REMOTE CONTROL UNIT CASE 9

SP1, SP2, SP2L, SP2V series

REFERENCE No. WM-530864

1. CIRCUIT BOARD LOCATIONS

1-1. MAIN BOARDS


L13L041
PW-1 (Power supply) board
Video pre-amp unit
Flat cable
Drum assy.
TM-2 (Control) board
TM-1 (Display, Timer & Tuning control) board
TM-6 (Video text decoder) board
CP-1 (Video, Servo & Audio) board
TB-1 (Terminal) board
TM-5 (OSA) board
VIF unit
RF converter
Tuner
TN-7 (Sync. det.) board
VD-1 (MESECAM det.) board
TM-8 (VPS) board
CP-2 (Servo & Syscon) board

Installed specific equipment and models
VD-1 (MESECAM det.) board: FVH-P1100 series, FVH-P1200 series and FVH-P1340HV.
TM-5 (OSA: on screen assist) board: FVH-P1200HV, P1200DK, P1200S and FVH-P1250 series.
TM-8 (VPS) board: FVH-P1100KV, FVH-P1200HV and FVH-P1340HV.
TM-6 (Video text decoder) board: FVH-P1340HV only.

Fig. 1-1

1-2. LOCATION FOR TAPE PATH ADJUSTMENT

NOTE: Test point TP182 and TP183 for tape path adjustment is shown in figure below.
For adjustment, refer to the separate volume "Mechanism Service Technical Information".

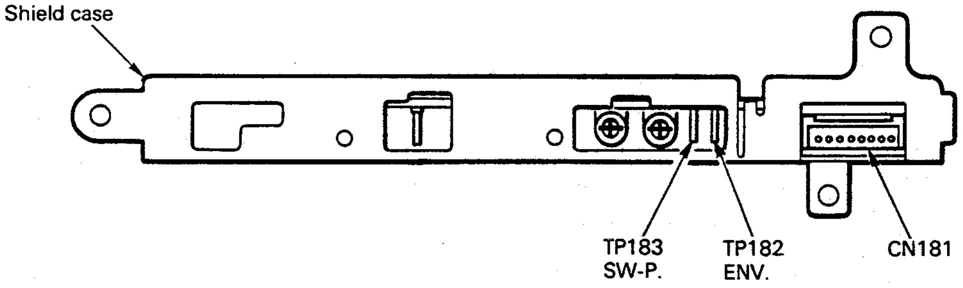

P06L012
Shield case
TP183
SW-P.
TP182
ENV.
CN181

Fig. 1-2 Video pre-amp unit

2. ELECTRICAL ADJUSTMENT

2-1. PREPARATION

2-1-1. EQUIPMENT

- Colour TV monitor
- PAL Colour-bar generator (with RF and LINE OUTPUT)
- Audio signal generator
- Oscilloscope (dual trace; frequency response: 10MHz or more; probe: 10:1)
- Frequency counter (countable to 10MHz or higher)
- Digital voltmeter
- AC voltmeter
- In/output probes
- Alignment cassette (VHJ-0008) PAL Colour bar 1KHz
- Alignment cassette (VHJ-0009) Monoscope 6KHz
- Alignment cassette (VHJ-0051) Check for D.O.C.
- Alignment cassette (VHJ-0023) PAL Monoscope 6KHz, PAL Colour-bar 1KHz, SECAM Colour-bar 1KHz, PAL RF Sweep MESECAM Colour-bar 1KHz, NTSC Colour-bar 1KHz.
- Relay jig (VHJ-0065) 5-wire cable for Pre-amp unit
- Relay jig (VHJ-0084) for CP-1 and CP-2 board
- Relay jig (VHJ-0085) for Video pre-amp unit

2-1-2. CONNECTING THE RELAY JIG

When repairing CP-1 and CP-2 board (see Figs. 2-1-2 and 2-1-3)

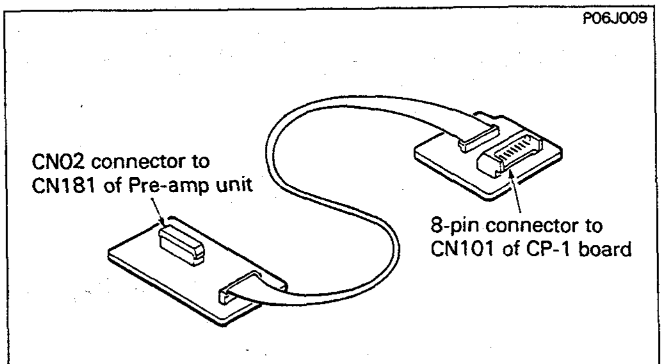
NOTE: The connection of any Relay jigs can be done without removing the front panel of the main unit.

1. Remove the seven screws of the CP-1 board to take out with CP-2 board connected.
2. Insert the CP-1 board with CP-2 board connected in the slit of chassis as shown in Fig. 2-1-3 (right).
3. Connect CN01 and CN02 of Relay jig (VHJ-0084) into connectors of the PW-1 board and the Pre-amp unit, in the direction of arrow as shown in Fig. 2-1-3 (left). Fix the relay jig with screw if necessary.
4. Connect 12-pin, 8-pin and 4-pin connectors of the Relay jig to connectors CN541, CN101 and CN201 on the CP-1 board, respectively.
5. Connect connector (1) from ACE head to CN06 of the Relay jig (VHJ-0084).
6. After finishing the repairs and adjustments, put the Flat cables back to its former position.

When repairing the Pre-amp unit (see Figs. 2-1-1 and 2-1-4)

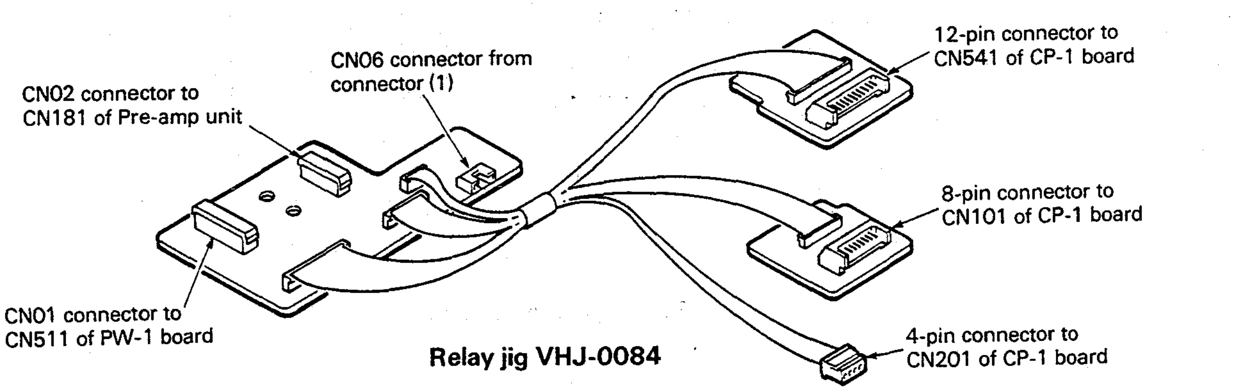
1. Remove the Pre-amp unit from the chassis, connect Relay jig (VHJ-0065) between the Pre-amp unit and drum assembly.
2. Connect Relay jig (VHJ-0084) excepting 8-pin connector between the PW-1 board and CP-1 board as shown in Fig. 2-1-4. Fix the relay jig with screw if necessary.
3. Connect Relay jig (VHJ-0085) between the top of Pre-amp unit and CN101 on the CP-1 board.

NOTE: When repairing or adjusting the Pre-amp unit, temporary fasten or securely touch one end of the shield case to the metal chassis.


P06J009
CN02 connector to CN181 of Pre-amp unit
8-pin connector to CN101 of CP-1 board

Relay jig VHJ-0085

Fig. 2-1-1


P06J010
CN06 connector from connector (1)
CN02 connector to CN181 of Pre-amp unit
12-pin connector to CN541 of CP-1 board
8-pin connector to CN101 of CP-1 board
CN01 connector to CN511 of PW-1 board
4-pin connector to CN201 of CP-1 board

Relay jig VHJ-0084

Fig. 2-1-2

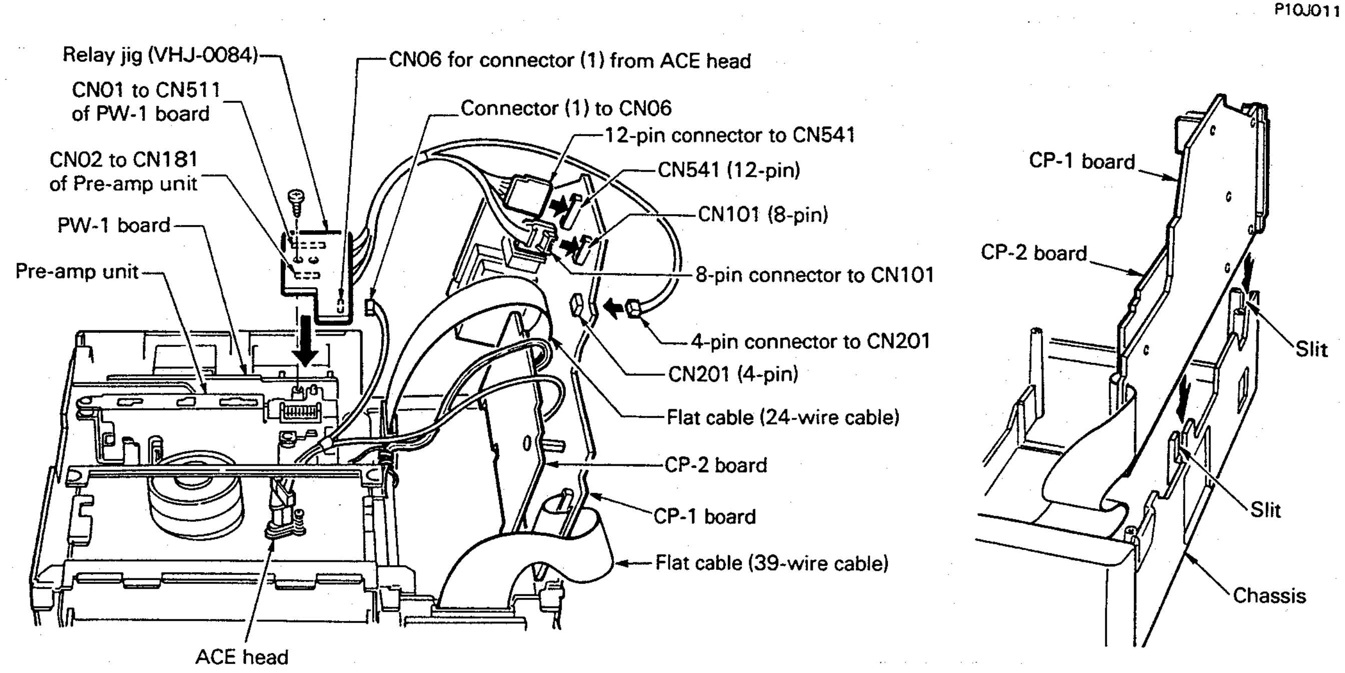

P10J011
Relay jig (VHJ-0084)
CN01 to CN511
of PW-1 board
CN02 to CN181
of Pre-amp unit
PW-1 board
Pre-amp unit
CN06 for connector (1) from ACE head
Connector (1) to CN06
12-pin connector to CN541
CN541 (12-pin)
CN101 (8-pin)
8-pin connector to CN101
4-pin connector to CN201
CN201 (4-pin)
Flat cable (24-wire cable)
CP-2 board
CP-1 board
Flat cable (39-wire cable)
ACE head
CP-1 board
CP-2 board
Slit
Slit
Chassis

Fig. 2-1-3

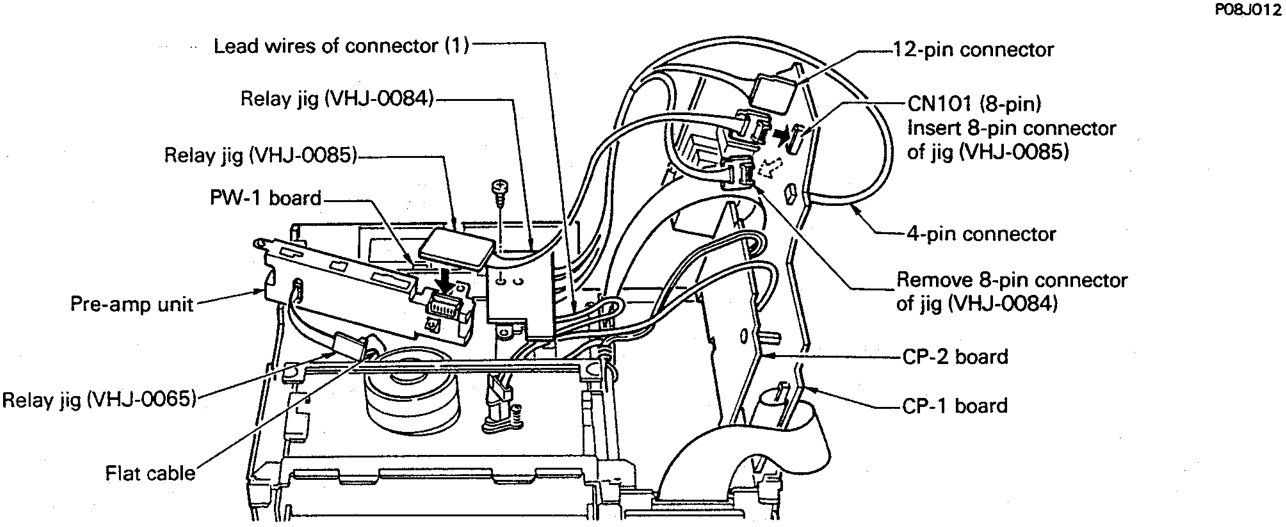

P08J012
Lead wires of connector (1)
Relay jig (VHJ-0084)
Relay jig (VHJ-0085)
PW-1 board
Pre-amp unit
Relay jig (VHJ-0065)
Flat cable
12-pin connector
CN101 (8-pin)
Insert 8-pin connector
of jig (VHJ-0085)
4-pin connector
Remove 8-pin connector
of jig (VHJ-0084)
CP-2 board
CP-1 board

Fig. 2-1-4

2-1-3. SET-UP

Because the RF input signal is used for circuit adjustments, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is improtant that the video output signal of the IF circuit satisfies the items shown in Fig. 2-1-5. Connect the oscilloscope to the VIDEO OUTPUT terminal of the video circuit and terminate with a 75Ω load, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3 Vp-p.
- The amplitude of the video signal should be approximately 0.7 Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3 Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.

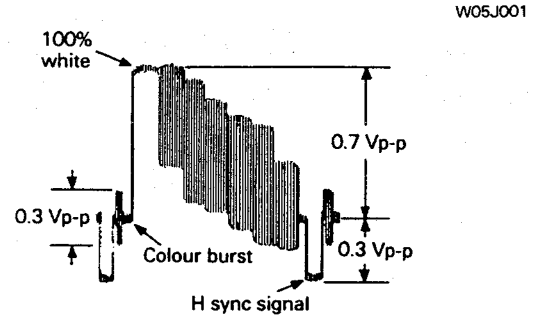
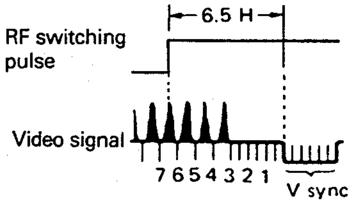

W05J001
100%
white
0.7 Vp-p
0.3 Vp-p
Colour burst
0.3 Vp-p
H sync signal

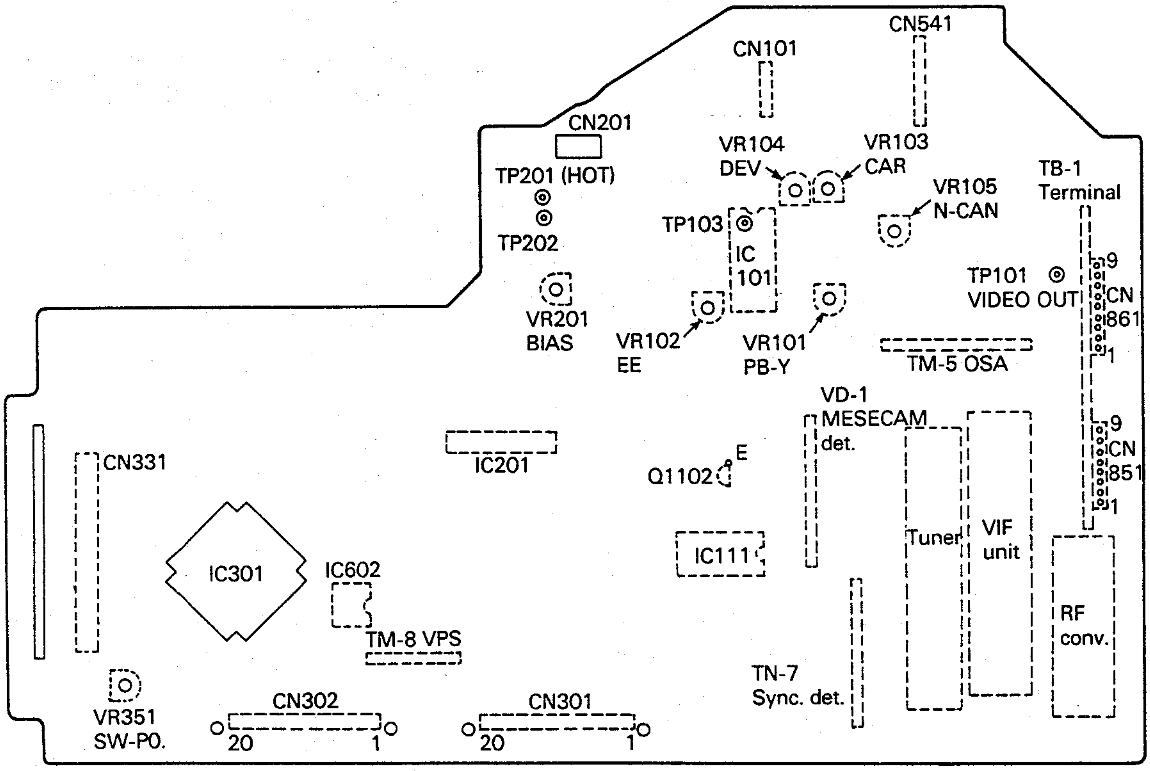
Fig. 2-1-5

2-2. SERVO CIRCUIT ADJUSTMENT ..... CP-1 board and Video pre-amp unit

NOTE (1) : These adjustments should be carried out upon completion of the transport adjustments.
(2) : If the tape transport adjustments are carried out after these adjustments, follow the procedures again in SWITCHING POSITIONS.

No.	Item	Input	Mode	Point	Location	Remark
1	SWITCHING POSITION	Alignment cassette (VHJ-0009 or VHJ-0023)	PLAY	VIDEO OUTPUT TP101 RF SW pulse TP183 (Video pre-amp unit)	VR351	W25S001  6.5 H RF switching pulse Video signal 7 6 5 4 3 2 1 V sync 1. Press the tracking control (+) (–) buttons simultaneously to the center position (on the display "T —:— "). 2. Adjust VR351 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ± 0.5 H from the rise of the RF switching pulse waveform.

P13S031

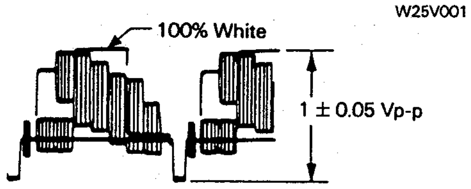
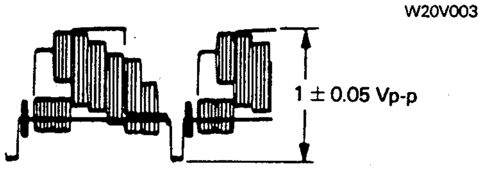
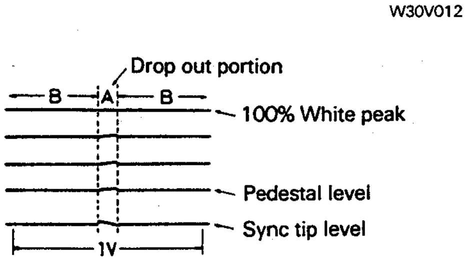
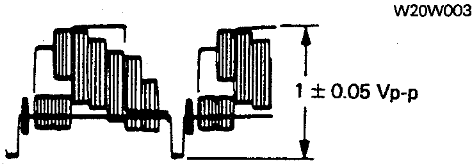


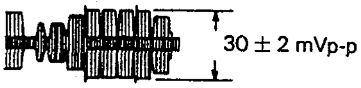
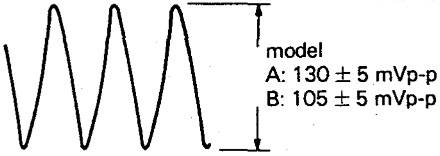
CN541
CN101
CN201
VR104 DEV
VR103 CAR
TP201 (HOT)
TB-1 Terminal
VR105 N-CAN
TP103
TP202
IC 101
9
TP101 VIDEO OUT
CN 861
1
VR201 BIAS
VR102 EE
VR101 PB-Y
TM-5 OSA
VD-1 MESECAM det.
9
CN 851
1
CN331
IC201
E
Q1102
Tuner
VIF unit
IC111
IC301
IC602
RF conv.
TM-8 VPS
TN-7 Sync. det.
VR351 SW-PO.
CN302
20
1
CN301
20
1

Fig. 2-2-1 CP-1 board (Foil side view)

2-3. VIDEO CIRCUIT ADJUSTMENT ... CP-1 board and Video pre-amp unit

NOTE (1) : Use the Relay jig mentiond in the 2-1. PREPARATION to provide easy adjustment of the Pre-amp unit.
(2) : When adjustment No. 1, No. 2 and No. 5 below, terminate VIDEO OUTPUT TP101 at 75 ohms.
(3) : 'No-signal REC mode' is not to supply any signal to VIDEO INPUT terminal.

No.	Item	Input	Mode	Point	Location	Remark
1	E-E LEVEL	Colour bar (100% white level) from Colour bar generator	E-E	VIDEO OUTPUT TP101 (CP-1 board)	VR102	 1. Adjust VR102 so that the level is 1.00 ± 0.05 Vp-p.
2	PB-Y LEVEL	Alignment cassette (VHJ-0008 or VHJ-0023)	PLAY	VIDEO OUTPUT TP101 (CP-1 board)	VR101	 1. Adjust VR101 so that the level is 1.00 ± 0.05 Vp-p.
3	N-CAN LEVEL	Alignment cassette (VHJ-0051)	PLAY	VIDEO OUTPUT TP101 (CP-1 board)	VR105	 W30V012 Drop out portion B A B 100% White peak Pedestal level Sync tip level 1V 1. Set the horizontal scale (TIME/DIV) of the oscilloscope to 1 msec./div.. 2. Adjust VR105 so that the drop out portion "A" of white peak (100%) and other portion "B" are same level.
4	CARRIER SET	No-signal	REC	TP103 (CP-1 board)	VR103	1. Set the channel selector buttons to the AV position and put the VCR in the no-signal REC mode. 2. Adjust VR103 so that the frequency is 3.80 ± 0.05 MHz.
5	DEVIATION	Colour bar (100% white level) from Colour bar generator	REC (Adjustment) ↓ PLAY (Check)	VIDEO OUTPUT TP101 (CP-1 board)	VR104	 1. Insert the blank tape to the VCR and record colour bar signal. 2. Playback the recorded part, and check that the level is 1.00 ± 0.05 Vp-p. 3. Repeat adjust VR104 before the record, and the playback it, if not satisfactory.

No.	Item	Input	Mode	Point	Location	Remark
6	C REC CURRENT	Colour bar from Colour bar generator	REC	TP181 (HOT) shield case (GND) (Video pre-amp unit)	VR181	W15V006  1. Rotate VR182 so that the luminance level is minimize. 2. Adjust VR181 so that the level is 30 ± 2 mVp-p.
7	Y REC CURRENT	No-signal	REC	TP181 (HOT) shield case (GND) (Video pre-amp unit)	VR182	W20V007  1. Set the channel selector buttons to AV position and put the VCR in the no-signal REC mode. 2. Adjust VR182 so that the level (model: mark A) is 130 ± 5 mVp-p, and also that the level (model: mark B) is 105 ± 5 mVp-p. 3. Follows are the applicable models and their corresponding mark.

Comparsion chart of Models and Marks

Model	Mark
FVH-P1100 series, FVH-P1200 series and FVH-P1340HV	A
FVH-P1250S	B

P06V012

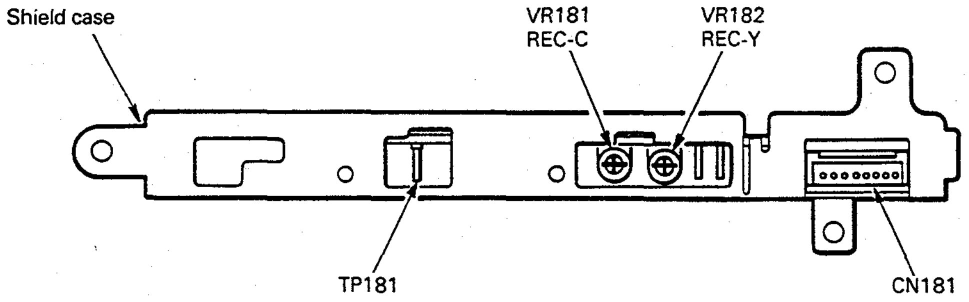


Fig. 2-3-1 Video pre-amp unit

2-4. VIDEO TEXT DECODER CIRCUIT ADJUSTMENT ... TM-6 and CP-1 board

No.	Item	Input	Mode	Point	Location	Remark
1	DECODER VXO	NONE	E-E	Emitter of Q1102 (CP-1 board) Fig. 2-2-1 see page 4	CT761	1. Set the vartical scale (VOLTAGE/DIV.) of the oscilloscope to 10 mV/DIV.. 2. Connect the frequency counter to Emitter of Q1102 and ground through a pre-amp of the above oscilloscope. 3. Press the "MENU" button on the remote control unit. 4. Adjust CT761 so that the frequency is 4433619 ± 20 Hz.

P08X003

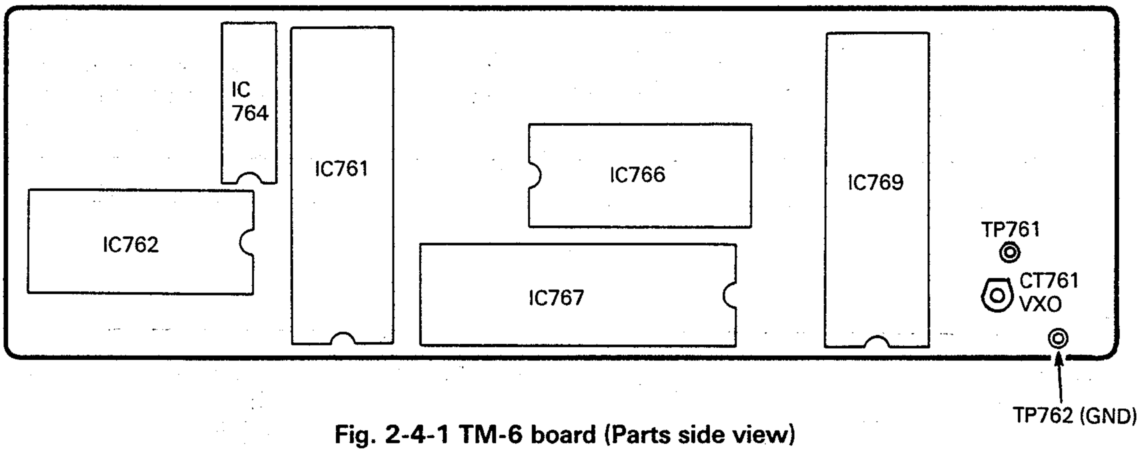

IC 764
IC761
IC766
IC769
IC762
IC767
TP761
CT761 VXO
TP762 (GND)

Fig. 2-4-1 TM-6 board (Parts side view)

2-5. AUDIO CIRCUIT ADJUSTMENT ... CP-1 board

No.	Item	Input	Mode	Point	Location	Remark
1	BIAS LEVEL	No-signal	REC	TP201 (HOT) TP202	VR201	1. Set the channel selector buttons to the AV position and put the VCR in the no-signal REC mode. 2. Adjust VR201 so that the level is 23 mVrms.

2-6. TUNER IF CIRCUIT ADJUSTMENT ... VIF unit

NOTE: There are two of the VIF unit's type and different with the model (see Fig. 2-6-1)

No.	Item	Input	Mode	Point	Location	Remark
1	RF AGC	TV broadcast	E-E	TV screen	VR611	1. Turn VR611 in the direction which causes snow to appear, then in the opposite direction until the snow just disappears.

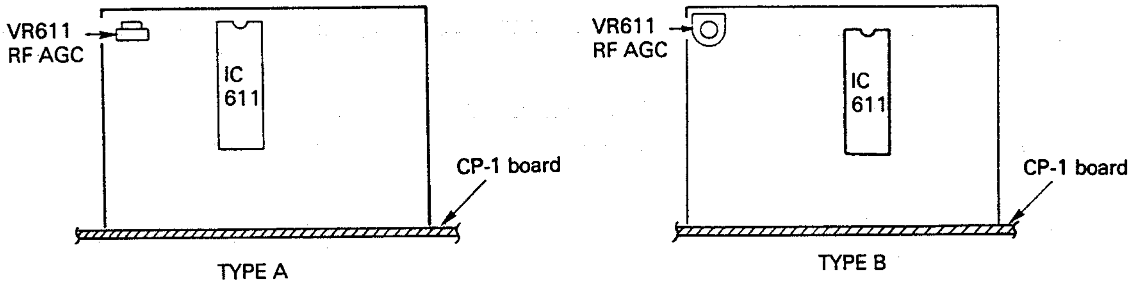

P06U001
VR611
RF AGC
IC
611
CP-1 board
TYPE A
VR611
RF AGC
IC
611
CP-1 board
TYPE B

Fig. 2-6-1 VIF unit (Parts side view)

3. DISASSEMBLY PROCEDURES

3-1. REMOVAL OF REMOTE CONTROL UNIT CASE

Open the remote control unit case as follows. Although a large type remote control unit is shown in the figure bellow, small type remote control unit can be opened by the same procedures.

NOTE: When opening the remote control unit for repairing, use a GUITER PICK made of plastic (1mm thickness) shown in the Fig. 3-1-2 or the like (a thin plastic piece) to prevent scratching.

*** Never use a metal screwdriver to avoid scrathing.**

1. Open the battery cover and take out batteries, the then remove the bottom case fixing screw.
2. Applying force strongly to the battery compartment edge in the arrow **(A)** direction by your thumb as shown in Fig. 3-1-1 to make a space **(B)** between the bottom and upper case as shown in the cross section Fig. 3-1-3.
   To make this procedure easier, push the remote control unit end **(C)** against your body.
3. Insert the GUITER PICK above mentioned into the space **(B)** as shown in Figs. 3-1-3, 3-1-4 and move the PICK in the arrow **(D)** and **(E)** direction, then disconnect two hooks **(F)** of the top of the cases.
4. Applying force to the space **(B)** and battery compartment edge by your thumb so that the bottom case is separated from the upper case as shown in the Fig. 3-1-5.
5. Insert the PICK into the space **(G)** of the case side slantingly against the bottom case and move the PICK to disconnect the hooks **(H)** of the side in order from top to bottom.
6. Disconnect the hooks of the other side using the pick by the same procedure as step 4.

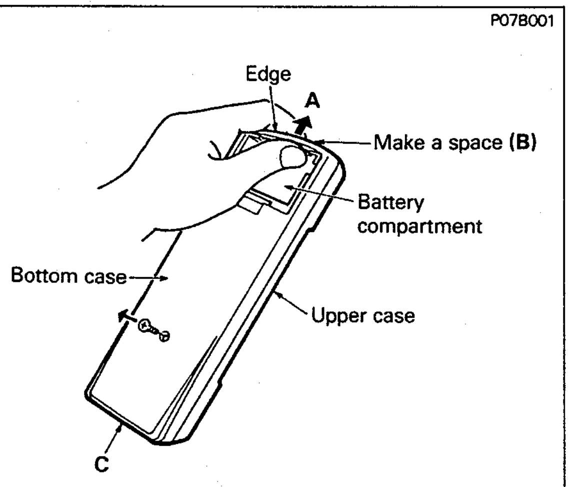

P07B001
Edge
A
Make a space (B)
Battery compartment
Bottom case
Upper case
C

Fig. 3-1-1

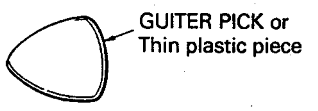

P07B002
GUITER PICK or Thin plastic piece

Fig. 3-1-2

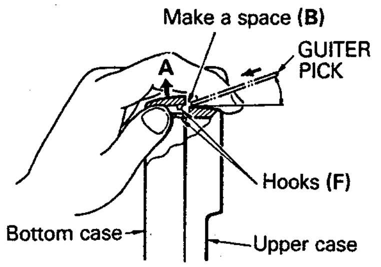

Make a space (B)
A
GUITER PICK
Hooks (F)
Bottom case
Upper case

Fig. 3-1-3

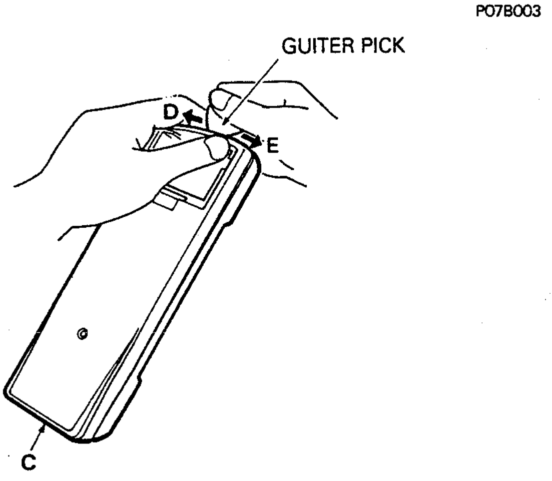

P07B003
GUITER PICK
D
E
C

Fig. 3-1-4

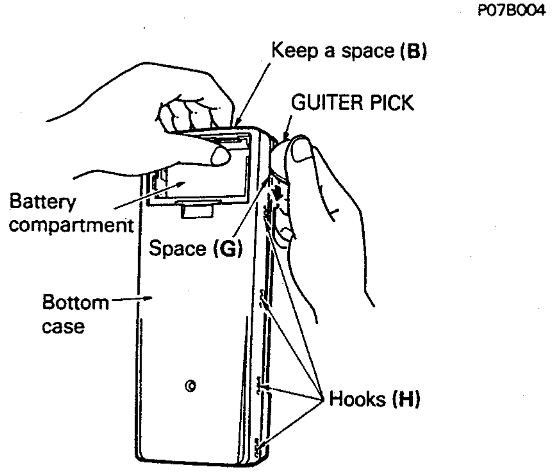

P07B004
Keep a space (B)
GUITER PICK
Battery compartment
Space (G)
Bottom case
Hooks (H)

Fig. 3-1-5

1 / WM530864 / **SANYO**
HL07I205 / SERVICE MANUAL EA / 0704709 **FISHER**

FISHER

Apr./'91/2600 HA Printed in Japan

1 / WM530598 /
HL04K1-2 / SERVICE MANUAL MECH / 0857[illegible]

SANYO

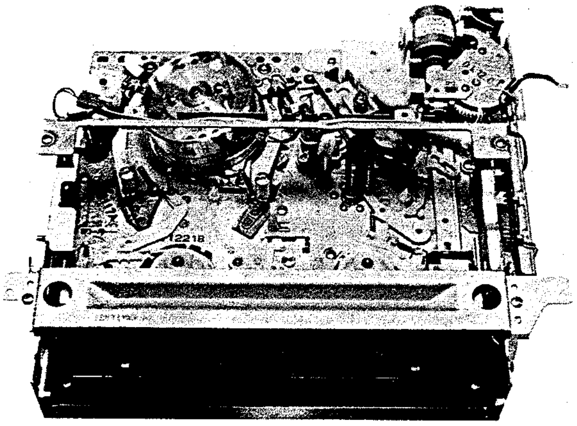
MECHANISM SERVICE TECHNICAL INFORMATION

FISHER

P90 MECHANISM

VIDEO CASSETTE RECORDER

VHS HQ
PAL SECAM



Contents

1.OUTLINE OF MECHANISM 1
- 1-1.FULL LOADING MECHANISM 1

2.DESCRIPTION OF MECHANISM OPERATION 3
- 2-1.BASIC OPERATION MODE OF MECHANISM 3
- 2-2.DESCRIPTION OF MECHANISM DRIVE 4
- 2-2-1.Tape Loading Mechanism 8
- 2-2-2.Pinch Roller Pressing Mechanism 9
- 2-2-3.Operation of Brake Control Plate 10
- 2-2-4.Brake Control Mechanism 11
- 2-2-5.Brake Lock Release Mechanism (FF/REW→STOP Mode) 12
- 2-3.REEL TABLE DRIVE 14
- 2-3-1.Tape Reel Table Drive Machanism 14
- 2-3-2.Reel Table Drive Clutch Lock and Release Mechanism 16
- 2-4.FRONT LOADING DRIVE SELECTION MECHANISM 18
- 2-5.CASSETTE HOLDER MECHANISM 22
- 2-5-1.Components 22
- 2-5-2.Description of Cassette Holder 23

3.MECHANISM CONTROL 24
- 3-1.MODE ARRANGEMENT 24
- 3-2.MODE DETECTION SWITCH 24
- 3-3.CONSIDERATION TO FULL LOADING 25

4.MECHANISM MAINTENANCE AND CHECKING 26
- 4-1.PERIODIC CHECKING, MAINTENANCE ITEM AND SERVICE JIGS 26
- 4-1-1.Periodic Check Items 26
- 4-1-2.Cleaning 27
- 4-1-3.Service Jigs 28
- 4-1.MODE SELECTOR (VHJ-0050)
- 4-2.HANDLING INSTRUCTIONS 29
- 4-2-1.Part Names 29
- 4-2-2.Connection 30
- 4-2-3.Handling 31

5.MECHANISM DISMANTLING AND BEASSEMBLING 32
- 5-1.MECHANISM MAIN UNIT 32
- 5-2.CASSETTE HOLDER MECHANISM 33
- 5-2-1.COMPL Cassette Mechanism 33
- 5-2-2.Gear Bracket Ass'y 34
- 5-2-3.Cassette Drive Gears (Right) 35
- 5-2-4.Cassette Drive Gears (Left) 36
- 5-2-5.FL Start Switch 37
- 5-2-6.T-TOP Sensor & T-END Sensor 38
- 5-3.COMPL HOLDER MOTOR (LOADING MOTOR BLOCK) 39
- 5-3-1.COMPL. Motor Bracket 39
- 5-3-2.Loading Motor 40
- 5-4.TAPE LOADING MECHANISM 42
- 5-4-1.Main Parts of the Loading Mechanism 42
- 5-4-2.Mode Cam 44
- 5-5.COMPL HEAD BRACKET (ACE HEAD) 45
- 5-6.PINCH ROLLER PRESSURE MECHANISM 46
- 5-7.BRAKE MECHANISM 48
- 5-7-1.Sub Take-up Brake Ass'y 48
- 5-7-2.Supply Brake Ass'y and Take-up Brake Ass'y 49
- 5-7-3.Tension Lever Ass'y and Band Holder Ass'y 50
- 5-7-4.Capstan Brake Ass'y 51
- 5-8.REEL TABLE DRIVE MECHANISM 52
- 5-8-1.Supply Reel Ass'y and Supply Reel Gear 52
- 5-8-2.Take-up Reel Ass'y 53
- 5-8-3.Take-up Reel Gear 52
- 5-8-4.Reel Pulley and Friction Gear Ass'y 55
- 5-8-5.COMPL Clutch 56
- 5-8-6.Clutch Change Lever and Clutch Lever Ass'y 57
- 5-9.CAPSTAN MOTOR 58
- 5-10.FIXED GUIDE, FE HEAD LEVER ASS'Y 59
- 5-10-1.Entrance Side Fixed Guide and FE Lever Ass'y 59
- 5-10-2.Impedance Roller, FTE Head 60
- 5-10-3.Exit Side Fixed Guide 61
- 5-11.DRUM SECTION 62
- 5-11-1.Drum Motor (rotor, stator) 62
- 5-11-2.Drum Unit 63
- 5-11-3.Upper Drum (Upper Cylinder) 64
- 5-12.HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED 67

6.MECHANISM ADJUSTMENT 68
- 6-1.OPERATING THE MECHANISM WITH NO CASSETTE INSERTED 68
- 6-2.REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK 69
- 6-2-1.Reel Table Height 69
- 6-2-2.Torque Check 70
- 6-3.TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK 71
- 6-3-1.Tension Pole Position Adjustment 71
- 6-3-2.Back Tension Torque Check 71
- 6-4.TAPE PATH ADJUSTMENT 72
- 6-4-1.Preparations for Adjustment 72
- 6-4-2.Adjustment by Visual Observation after Guide Roller, Fixed Guide or COMPL Head Bracket Replacement 73
- 6-4-3.Entrance Side Fixed Guide (S) Height Adjustment 74
- 6-4-4.Guide Roller Adjustment 75
- 6-4-5.Exit Side Fixed Guide (T) Adjustment 76
- 6-4-6.COMPL Head Bracket (ACE Head) Adjustment 76
- 6-4-7.Checking after Adjustment 78

III. F/R search
FF↔F-SEARCH and REW↔R-SEARCH can be made direct by reducing the mode transition time.

(3) Protection mechanism for full loading system

I. Video Tape Protection Mechanism
- (a) FF/REW→STOP
  Tape tension applied to the head drum when stopping is lowered by optimizing the balance between the left and right, and brake forces acting on the left and right reel table. Thereby it prevents from causing a scratch on the tape due to V-head when stopping.
- (b) STOP→FF/REW
  The starting-up speed of the capstan motor is ingeniously designed to preclude the possibility of unusual tape tension at the time of REW/FWD start-up.
- (c) Tape end brake damping
  The design of the mechanism is so made that the time from issuance of an electrical STOP command till actual brake application is reduced to a minimum. This enable the braking to be completed before the reader tape end.
- (d) FF/REW running
  To ensure highly stable tape running in any condition and any environment, design consideration is given to the foundation brake torque (soft brake) to the reel table and the tape winding angle with respect to each tape guide. Particularly in regard to the supply side fixing guide and F.T.E (Full Track Erase) head, the design is so made that they do not come into contact with the tape at the time of FF/REW operation to alleviate load application.

II. Final End Position Tape Loading Protection Mechanism
Tape pull-out (loading) from within the cassette is done to ensure proper take-up of the tape onto the head drum. At that time, the tape is extended from the supply reel side.
So, if the tape is wound to the final end, no loading can be made. For this reason, a mode is designed to allow the tape to be rewound a little at the final end of the tape without any loading done.

1. OUTLINE OF MECHANISM

This mechanism is named P-90 Mechanism. Its features include :

(1) The chassis is fabricated by drawing a 1.6mm thick electric zinc plated steel sheet, and mechanical parts are ingeniously laid on this chassis. The mechanism is as thick as 70.3 mm.

(2) After insertion of a cassette, the tape is normally wound to the head drum based on the full loading system. This design results in the shortening of the mode shift time, that is, the time from the depression of the PLAY pushbutton switch to the video image display on screen has been significantly quickened.

(3) The full loading system employed has the F/R search capability (when the same button (F.FWD or REW) is pressed in the F.FWD or REW modes, the search mode playback image appears on the screen).

(4) Also, a thin type head drum without lead is provided to increase the operating convenience of the equipment to a considerable extent.

(5) The drive source for cassette loading and the motor for the tape loading mode selection are used in combination with the head motor and the capstan motor for realization of a 3-motor system.

1-1. FULL LOADING MECHANISM

(1) Description of full loading mechanism
As shown in Fig. 1-1 a tape has hitherto been wound onto the head drum only in the PLAY and F/R SEARCH mode, but in this radically new mechanism, in every mode can be made with the tape kept wound onto the head drum.

(2) Features of full loading mechanism
With the provision of the full loading mechanism, the operating convenience, which was hitherto a drawback of the VHS system, has been improved. A host of other salient features are also designed into this mechanism as apparent from the following description.

I. Quick playback
Mode shift time such as the STOP→PLAY and FF/REW→PLAY has been shortened for quicker playback.

II. High-speed VISS
The time from the detection of VISS search signal based on the VHS standardized search system till image display on the screen has considerably been shortened to make high-speed VISS possible.

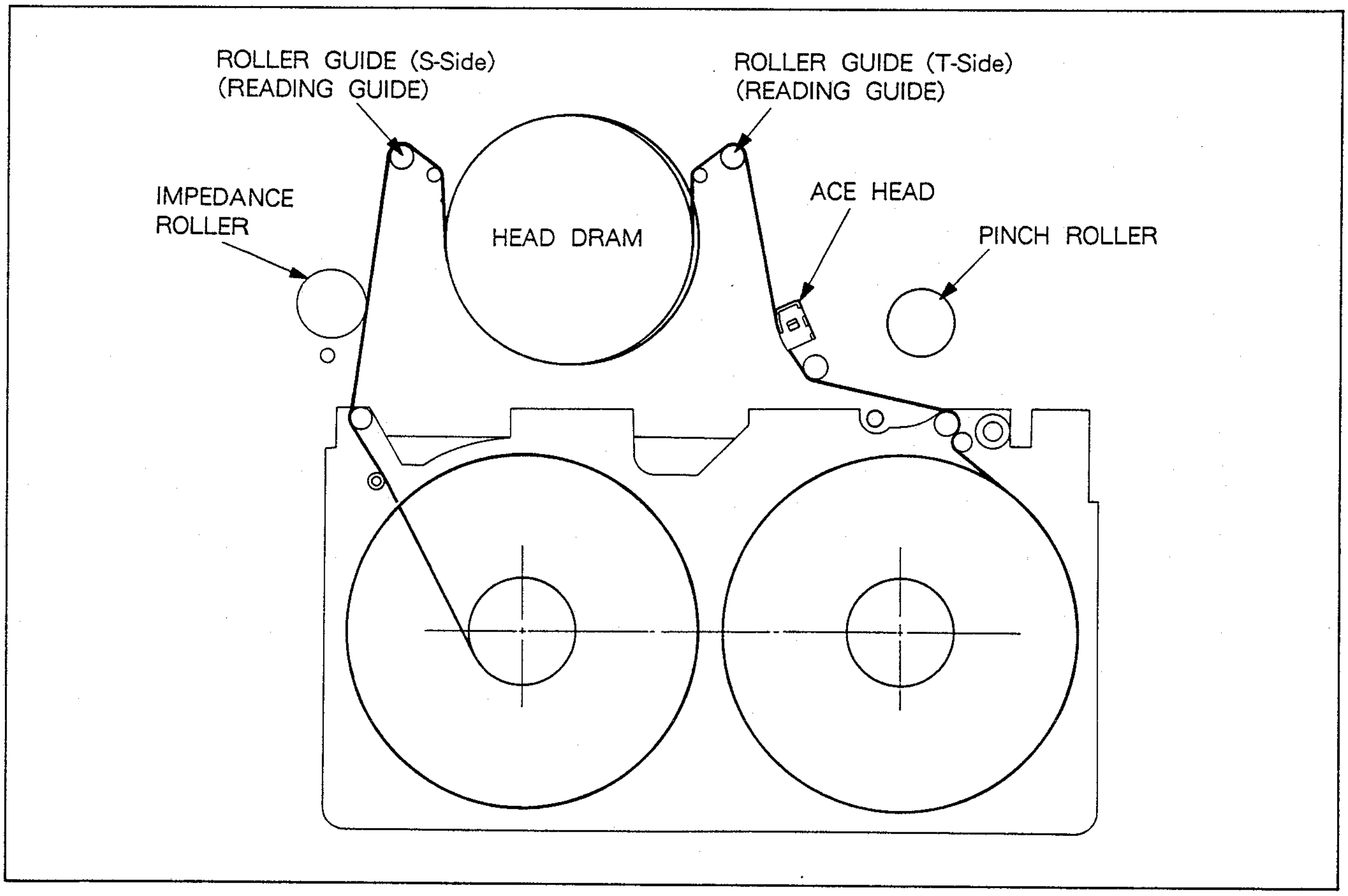
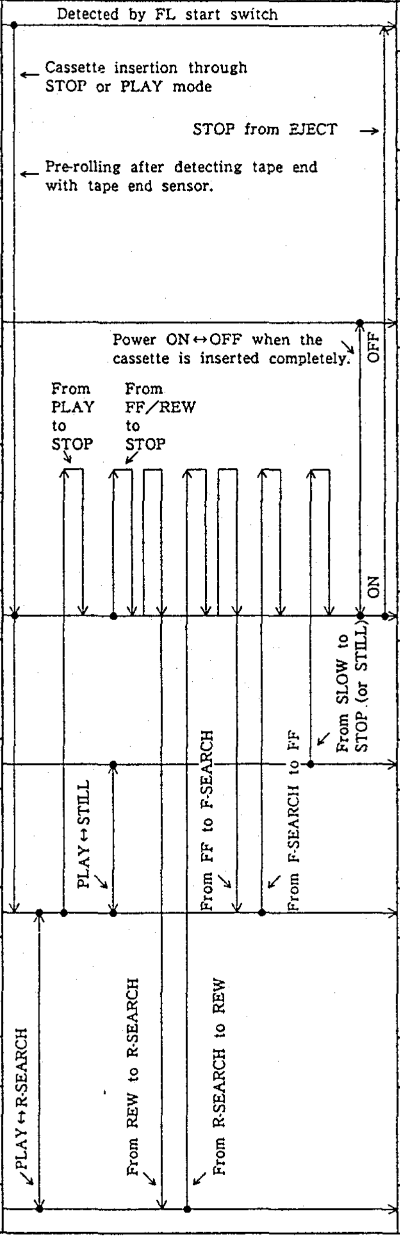


Fig. 1-1 FULL LOADING SYSTEM (AT FF/REW MODE)

2. DESCRIPTION OF MECHANISM OPERATION

2-1. BASIC OPERATION MODE OF MECHANISM

The P-90 mechanism has its original modes such as given in Table 2-1, in addition to the VTR is operation modes (STOP, FF, REW, PLAY, REC, R-SEARCH, F-SEARCH, STILL, SLOW, and ETS). These modes specific to the mechanism play important roles in tape protection operation at the time of a shift to various modes of the VTR above. A shift to the mode specific to the mechanism is carried out by controlling the rotation of the loading motor with the control signal of the system control circuit. The detection of important mechanism operation mode positions is done by using the FL START SWITCH for detecting the cassette ejection/insertion, and the MECHANISM MODE SWITCH for detecting each mode of the mechanism (3 bit MODE DATA is output by operating the rotary switch).

Mechanism Mode	Mechanism Mode Switch			HEX DATA	Function	Main Mode Shifting Conditions	VTR Operation Mode
	3	2	1				
EJECT	–	–	–		Eject position		EJECT
					Front loading/Unloading		
SHORT REW	–	–	–		Take up operation in the tape end position		Low side of ⑤. Sensed upon IN
INITIAL	1	1	1	⑦	Power off position		Power off when tape is loaded completely
					Tape unloading position Tape loading Tape loading ending position		
BRAKE	0	0	1	①	Main brake applying position		
STOP / FF/REW	0	1	0	②	STOP waiting and FF/REW (the head motor rotation)		STOP, FF/REW
STILL	0	1	1	③	The positions of STILL, SLOW or F-ADV.		STILL, SLOW, F-ADV
PLAY	1	0	0	④	From FWD direction Normal running mode		PLAY, REC, F-SEARCH
IDLER	1	0	1	⑤	Forward/reverse changeover position		PAUSE
REV	1	1	0	⑥	From REV direction Normal running mode		R-SEARCH

Detected by FL start switch
Cassette insertion through STOP or PLAY mode
STOP from EJECT
Pre-rolling after detecting tape end with tape end sensor.
Power ON↔OFF when the cassette is inserted completely.
OFF
ON
From PLAY to STOP
From FF/REW to STOP
From SLOW to STOP (or STILL)
PLAY↔STILL
From FF to F-SEARCH
From F-SEARCH to FF
PLAY↔R-SEARCH
From REW to R-SEARCH
From R-SEARCH to REW

Table 2-1

2-2. DESCRIPTION OF MECHANISM DRIVE

To realize the thin type mechanism, a loading motor and two pieces of cam (MAIN CAM GEAR and the MODE CAM GEAR) to be driven by the said motor are mounted on the upper part of the capstan motor, that was a dead space in the conventional mechanisms hitherto available with a view to optimization of parts mounting layout. (Fig. 2-1 and Fig. 2-2.)

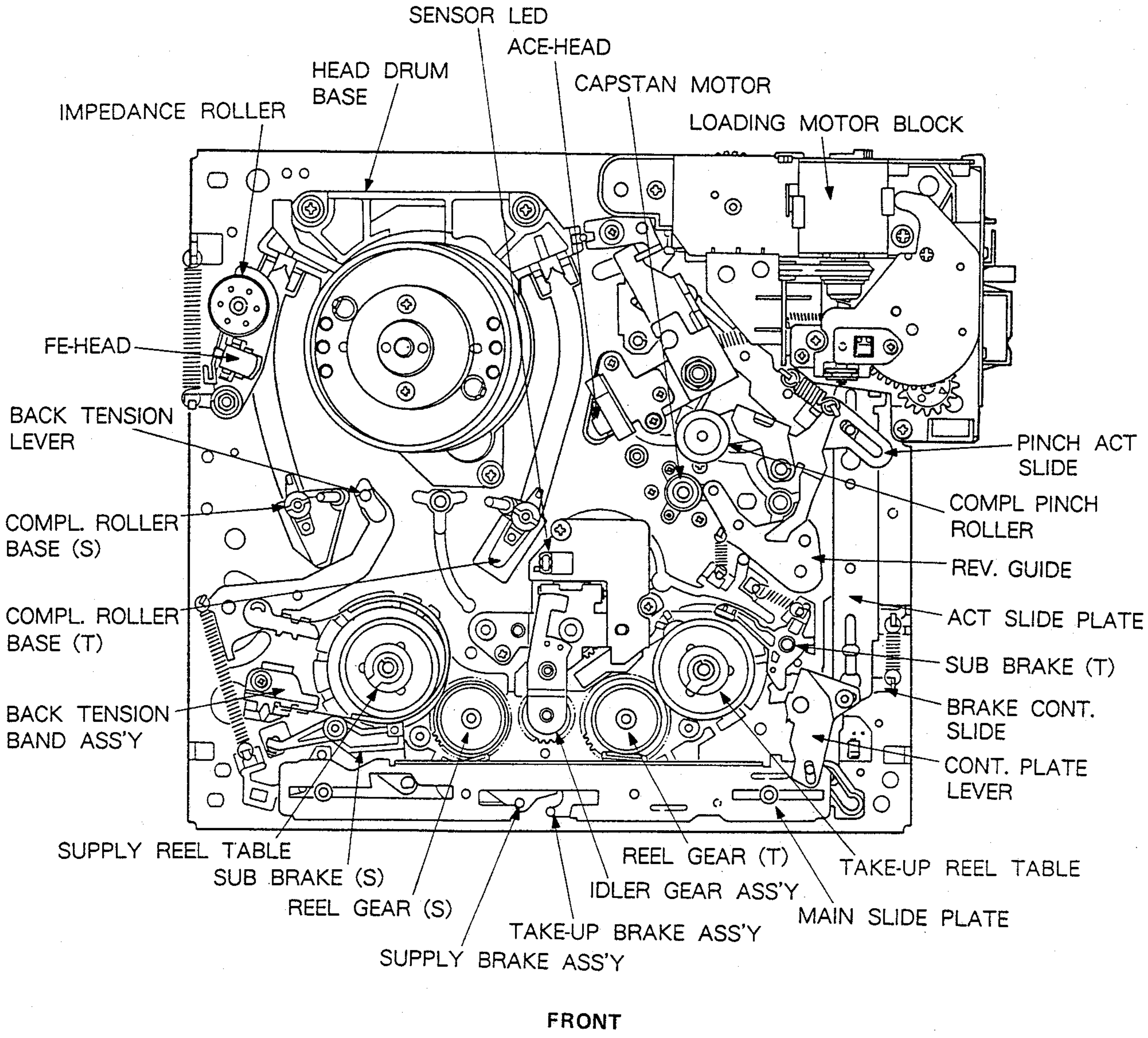

SENSOR LED
ACE-HEAD
HEAD DRUM BASE
CAPSTAN MOTOR
IMPEDANCE ROLLER
LOADING MOTOR BLOCK
FE-HEAD
BACK TENSION LEVER
PINCH ACT SLIDE
COMPL PINCH ROLLER
COMPL. ROLLER BASE (S)
REV. GUIDE
COMPL. ROLLER BASE (T)
ACT SLIDE PLATE
SUB BRAKE (T)
BACK TENSION BAND ASS'Y
BRAKE CONT. SLIDE
CONT. PLATE LEVER
SUPPLY REEL TABLE
REEL GEAR (T)
TAKE-UP REEL TABLE
SUB BRAKE (S)
IDLER GEAR ASS'Y
REEL GEAR (S)
MAIN SLIDE PLATE
TAKE-UP BRAKE ASS'Y
SUPPLY BRAKE ASS'Y
FRONT

Fig. 2-1 TOP VIEW OF MECHANISM (INITIAL MODE)

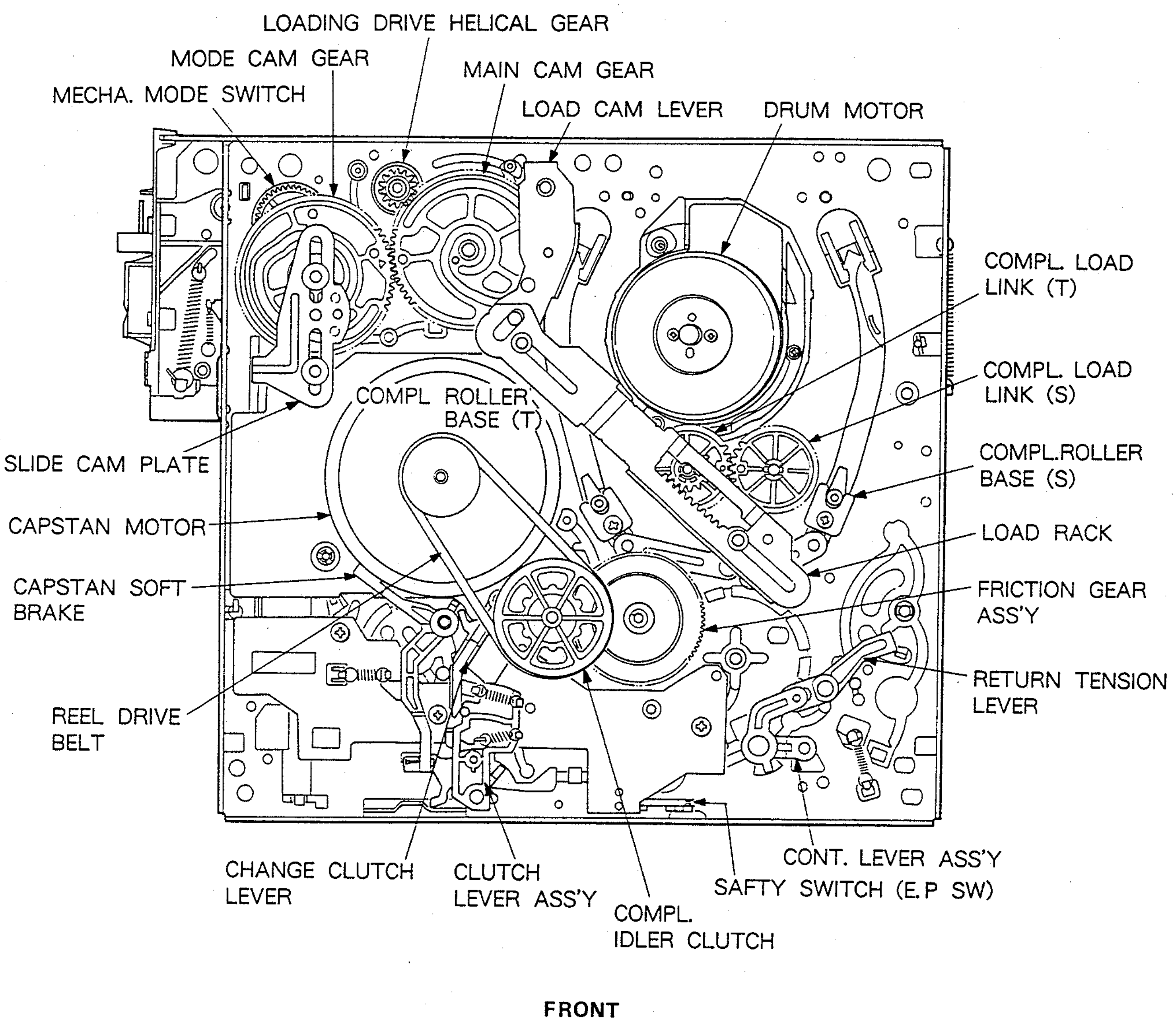

LOADING DRIVE HELICAL GEAR
MODE CAM GEAR
MAIN CAM GEAR
MECHA. MODE SWITCH
LOAD CAM LEVER
DRUM MOTOR
COMPL. LOAD LINK (T)
COMPL. LOAD LINK (S)
COMPL ROLLER BASE (T)
SLIDE CAM PLATE
COMPL.ROLLER BASE (S)
CAPSTAN MOTOR
LOAD RACK
CAPSTAN SOFT BRAKE
FRICTION GEAR ASS'Y
RETURN TENSION LEVER
REEL DRIVE BELT
CONT. LEVER ASS'Y
SAFTY SWITCH (E.P SW)
CHANGE CLUTCH LEVER
CLUTCH LEVER ASS'Y
COMPL. IDLER CLUTCH
FRONT

Fig. 2-2 BOTTOM VIEW OF MECHANISM (INITIAL MODE)

These two cams have one CAM GROOVE on both sides. A total of four CAM GROOVEs performs independent functions to meet the multi-function needs of these days by driving the elements of a wide variety of functions with the motor precisely controlled by a microcomputer.
The two cams are positive motion cams having a groove over 570 degrees. These cams cause the amount of lift to be changed by a mild gradient according to the angle of rotation while synchronizedly being rotated by an outer circumferential gear to alleviate the load exerted on the cams when driving the rod linked with the cams and also to ensure position stability in each mode of operation. The geometry of each cam and that of a metal fitting of the drive section are shown in Fig. 2-3 and Fig. 2-4, respectively. Also, the role of each cam used is described below.
On the GROOVE 3 side of MODE CAM GEAR have a small gear. This small gear is engaged with the MECHANISM MODE SWITCH as shown in Fig. 2-3., and detect the mechanism operation mode. In this way, the two cams and the MECHANISM MODE SWITCH are rotated synchronously, and the mechanism is fully synchronized and driven for each mode.

MAIN CAM GEAR : CAM GROOVE 1.
Pinch roller pressing operation
CAM GROOVE 2.
Tape loading mechanical drive
MODE CAM GEAR : CAM GROOVE 3.
Brake and clutch selecting operation
CAM GROOVE 4.
Brake control and front unloading control

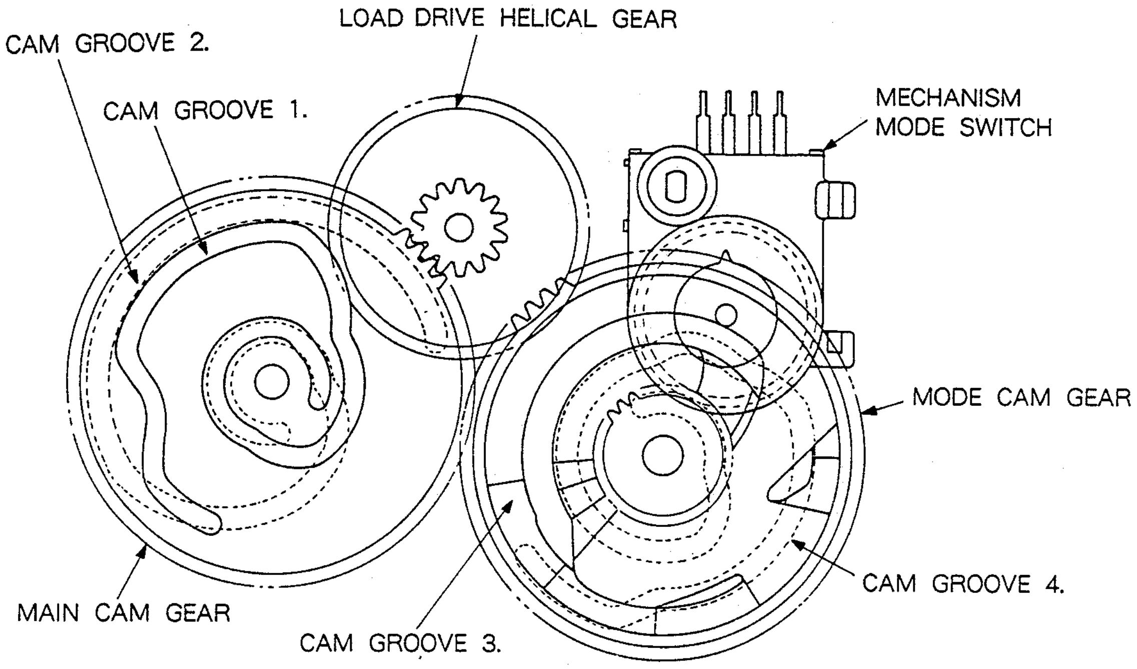


Fig. 2-3 PLAN OF CAMS CONSTRUCTION

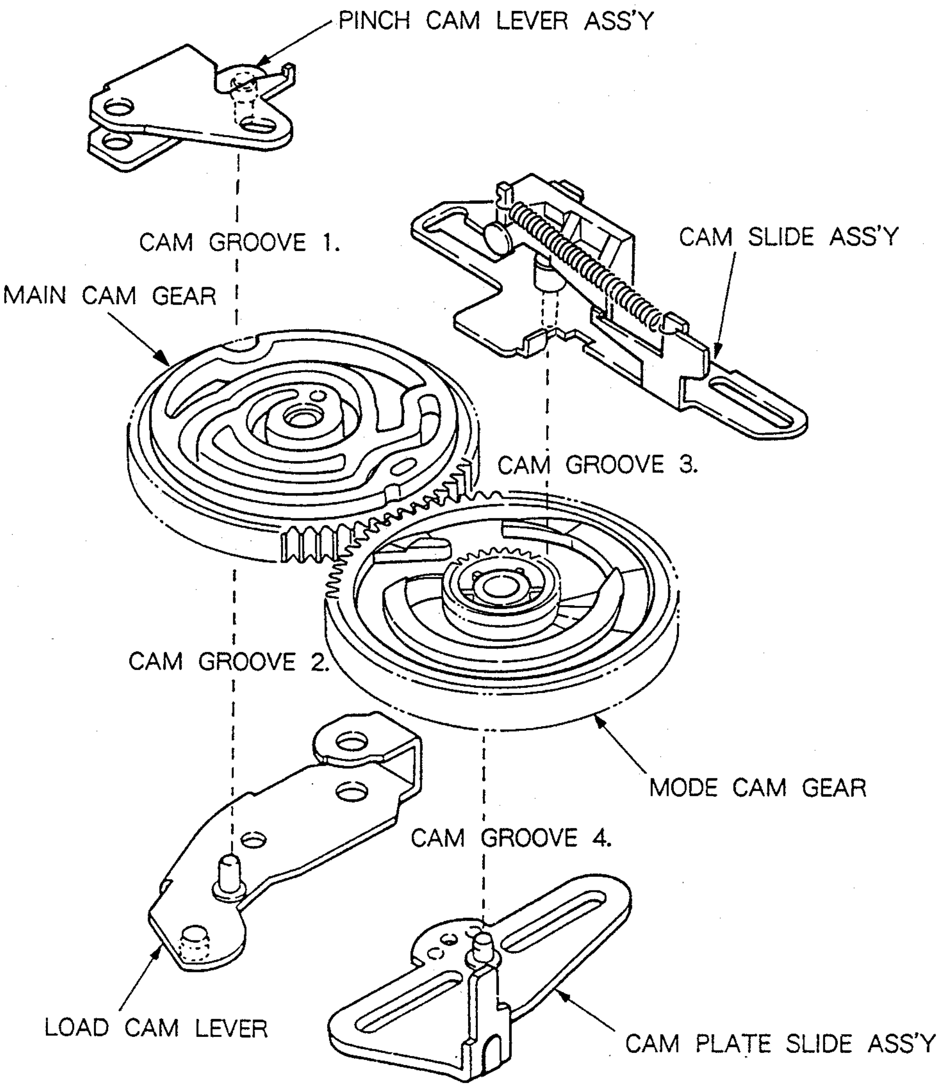

PINCH CAM LEVER ASS'Y
CAM GROOVE 1.
CAM SLIDE ASS'Y
MAIN CAM GEAR
CAM GROOVE 3.
CAM GROOVE 2.
MODE CAM GEAR
CAM GROOVE 4.
LOAD CAM LEVER
CAM PLATE SLIDE ASS'Y

Fig. 2-4 VIEW OF CAMS CONSTRUCTION

2-2-1. Tape Loading Mechanism

The tape loading mechanism is compactly designed with use of a LOAD RACK for loading by drive from the before-mentioned MAIN CAMs with CAM GROOVE 2. The LOAD RACK is laid on the dead space in between the DD capstan motor and the head motor for effective space utilization.(Fig. 2-5) The process from tape pull-out upon loading to contact of the leading guide section with the stopper of drum base and press-fitting under tension of spring is guided and driven in such a manner that the rod is drawn inward from the outer circumferential direction of the CAM GROOVE 2, thereby reducing the load torque (PV value) to the CAM GROOVE. And, the load of the loading motor is minimized to enhance reliability.

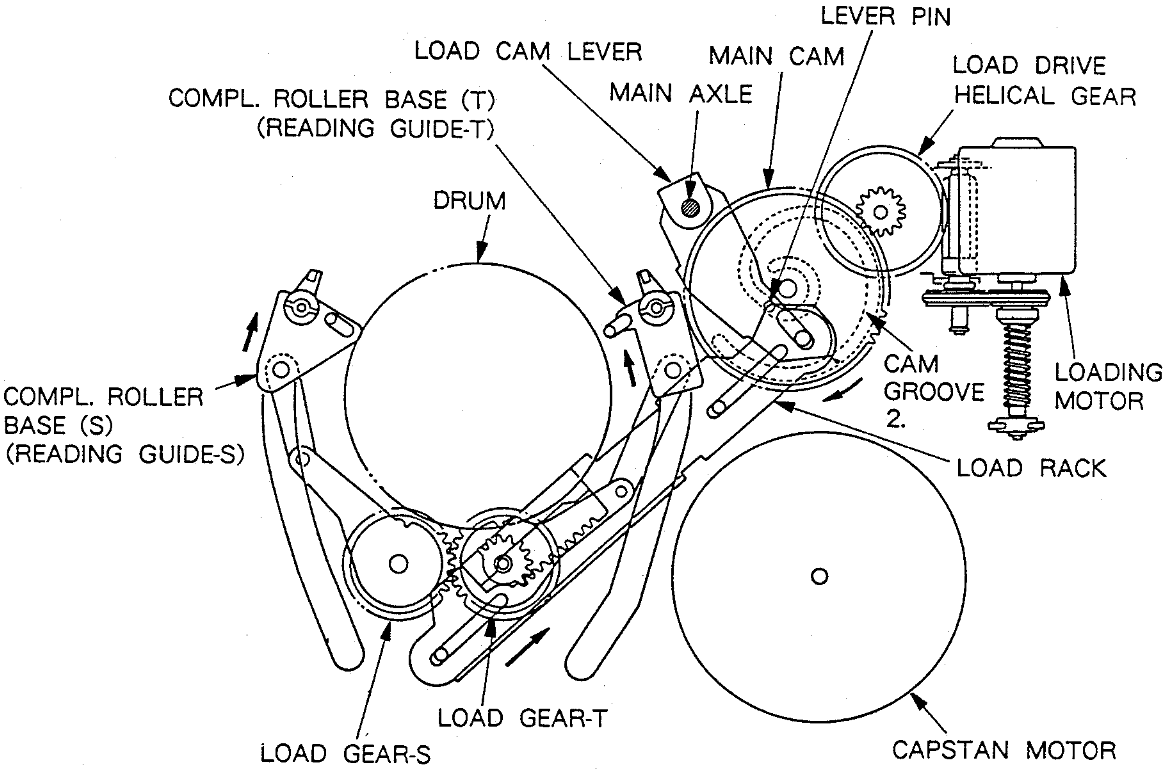

LEVER PIN
LOAD CAM LEVER
MAIN CAM
LOAD DRIVE HELICAL GEAR
COMPL. ROLLER BASE (T) (READING GUIDE-T)
MAIN AXLE
DRUM
CAM GROOVE 2.
LOADING MOTOR
COMPL. ROLLER BASE (S) (READING GUIDE-S)
LOAD RACK
LOAD GEAR-T
LOAD GEAR-S
CAPSTAN MOTOR

Fig. 2-5 CONSTRUCTION OF TAPE LOADING MECHANISM

2-2-2. Pinch Roller Pressing Mechanism

The PINCH LEVER assembly of the pinch roller is operated by the PINCH CAM LEVER (rod) driven by the CAM GROOVE 1 of the before-mentioned MAIN CAM, and then press-fitted to the capstan. The revolving tape guide (REV.GUIDE) is interlockingly operated with the PINCH LEVER assembly to ensure stable tape running at a fixed speed. (Fig. 2-6)

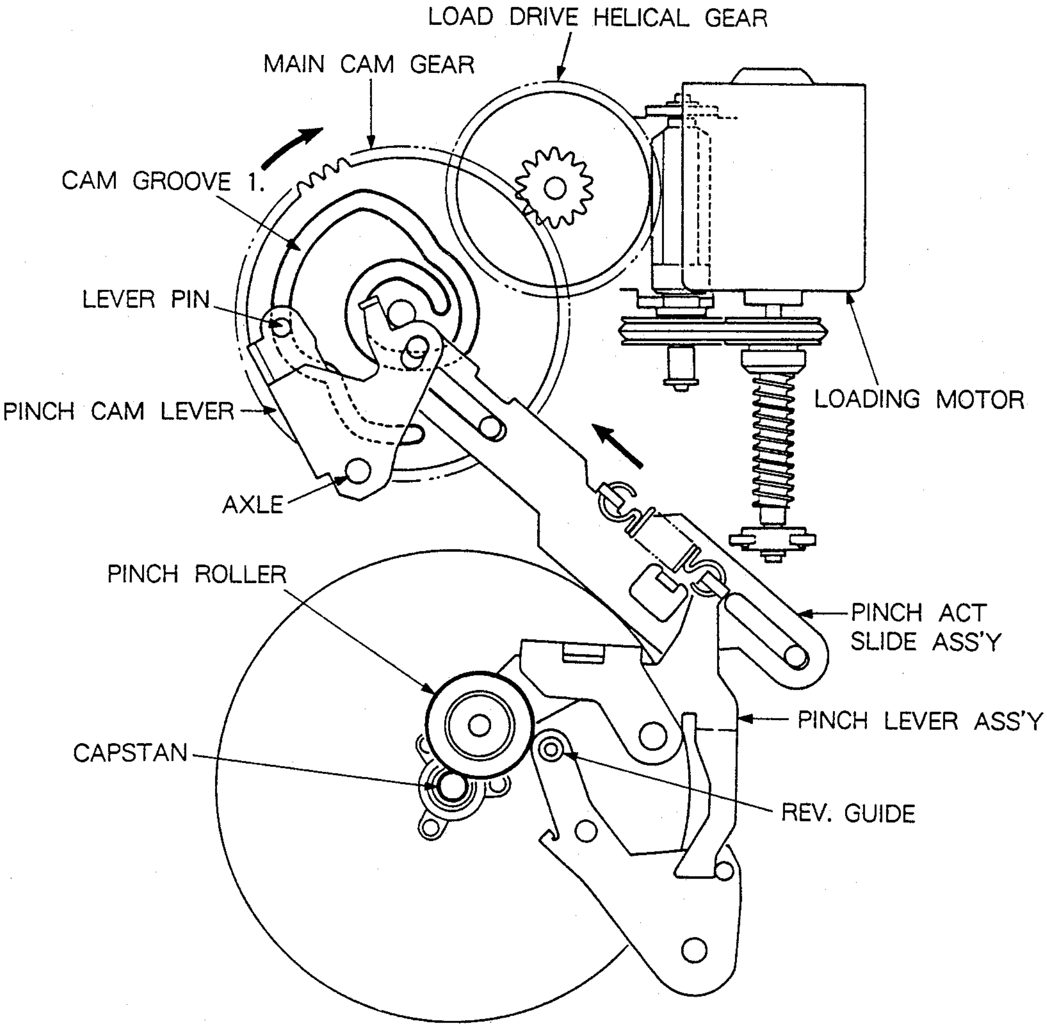

LOAD DRIVE HELICAL GEAR
MAIN CAM GEAR
CAM GROOVE 1.
LEVER PIN
PINCH CAM LEVER
AXLE
LOADING MOTOR
PINCH ROLLER
PINCH ACT SLIDE ASS'Y
PINCH LEVER ASS'Y
CAPSTAN
REV. GUIDE

Fig. 2-6 CONSTRUCTION OF PINCH ROLLER MECHANISM

2-2-3. Operation of Brake Control Plate

The ACT SLIDE PLATE and the MAIN SLIDE PLATE shown in Fig. 2-7 is driven by the CAM GROOVE 4 of the MODE CAM GEAR for precise control of operations including the control of back tension lever, auxiliary brake (SUB BRAKE S/T), main brake (SUPPLY BRAKE and TAKE-UP BRAKE), clutch selection, and drive selection of front loading mechanism.

Also, the mechanism mode switch is engaged with the small gear of the MODE CAM GEAR for sync rotation. At the time, the detection position of each mode is set so that it becomes the flat section at the cam curve of the CAM GROOVE 4 of the MODE CAM GEAR. So, even if motor stop time deviation occurs due to the load following the detection of the loading motor stop position, the control plate linked with a stop in the specified position.

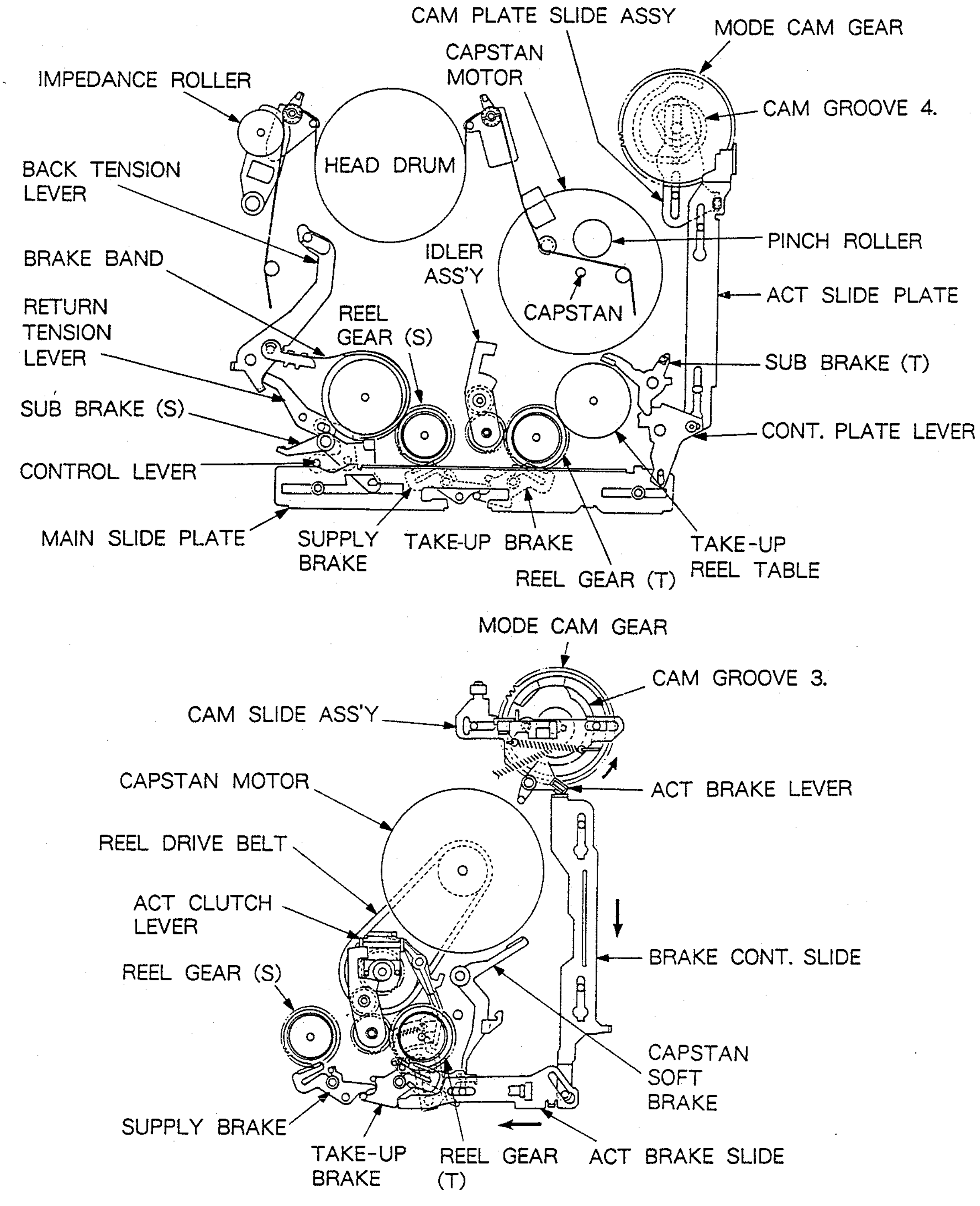

CAM PLATE SLIDE ASSY
MODE CAM GEAR
CAPSTAN MOTOR
IMPEDANCE ROLLER
CAM GROOVE 4.
BACK TENSION LEVER
HEAD DRUM
BRAKE BAND
IDLER ASS'Y
PINCH ROLLER
RETURN TENSION LEVER
REEL GEAR (S)
CAPSTAN
ACT SLIDE PLATE
SUB BRAKE (T)
SUB BRAKE (S)
CONT. PLATE LEVER
CONTROL LEVER
MAIN SLIDE PLATE
SUPPLY BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
TAKE-UP REEL TABLE
MODE CAM GEAR
CAM GROOVE 3.
CAM SLIDE ASS'Y
CAPSTAN MOTOR
ACT BRAKE LEVER
REEL DRIVE BELT
ACT CLUTCH LEVER
BRAKE CONT. SLIDE
REEL GEAR (S)
CAPSTAN SOFT BRAKE
SUPPLY BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
ACT BRAKE SLIDE

Fig. 2-7 CONSTRUCTION OF BRAKE CONTROL PLATE (AT REW/FF, STOP MODE)

2-2-4. Brake Control Mechanism

The mechanical logic of the brake state is shown in Fig. 2-8. The brake which damps the reel rotation is operated by the BRAKE CONTROL SLIDE driven from the CAM GROOVE 3 of the MODE CAM GEAR.

Also, to alleviate damage to the tape caused by high tension of the brake in operation, the tape is stopped after brake operation and the shape is thoughtfully designed for proper biting-in ratio of the left and the right brakes after-mentioned to each other.
This enables the supply brake to be released by the operation of the above-mentioned MAIN SLIDE PLATE after an elapse of prefixed slight time to reduce the tape tension to zero, and to provide the tape with a proper degree of looseness. As a result, a slight gap is created in the tape from the HEAD DRUM.

Further, a momentary still mechanism which dispenses with use of a plunger solenoid is not provided as one of design features of the P-90 mechanism.
To stabilize the image in an extremely short period of time during a shift to the STILL mode from the PLAY mode, the auxiliary brake (CAPSTAN SOFT BRAKE) is press-fit to the outer circumference of the capstan motor by the before-mentioned CAM GROOVE 3 of the MODE CAM GEAR.
These operations is interlocked with the operation of the before-mentioned ACT SLIDE PLATE and the MAIN SLIDE PLATE. It consists of one MODE CAM for offsetting the operating position.

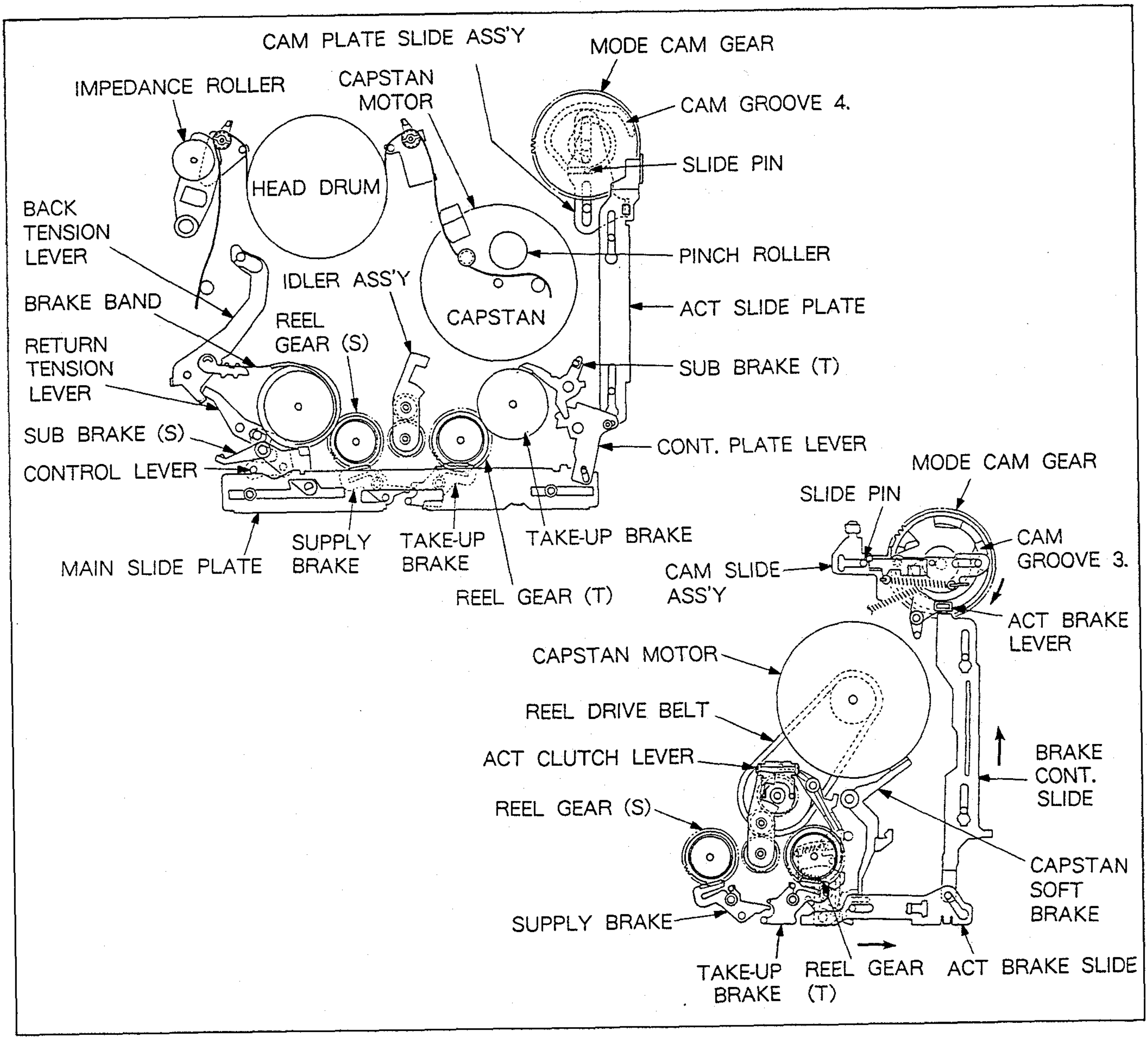
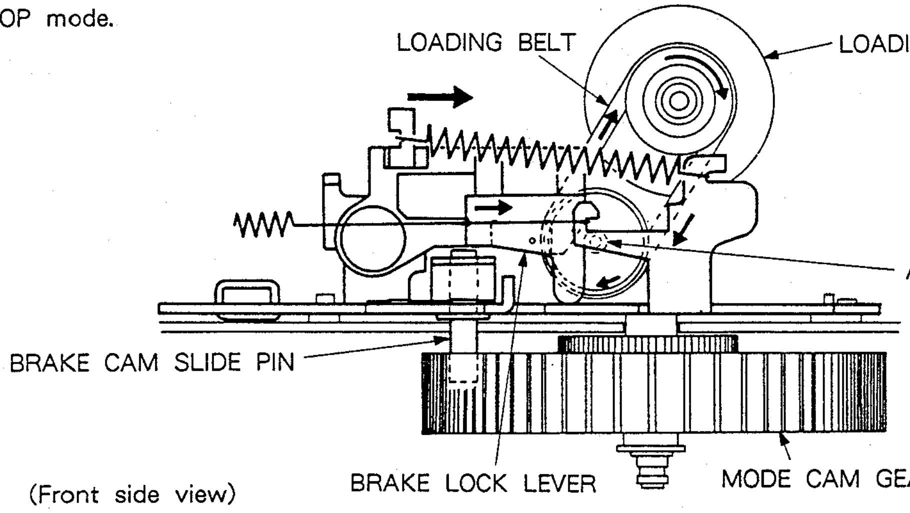

CAM PLATE SLIDE ASS'Y
MODE CAM GEAR
IMPEDANCE ROLLER
CAPSTAN MOTOR
CAM GROOVE 4.
SLIDE PIN
HEAD DRUM
BACK TENSION LEVER
PINCH ROLLER
IDLER ASS'Y
ACT SLIDE PLATE
BRAKE BAND
CAPSTAN
REEL GEAR (S)
RETURN TENSION LEVER
SUB BRAKE (T)
SUB BRAKE (S)
CONT. PLATE LEVER
CONTROL LEVER
MODE CAM GEAR
SLIDE PIN
SUPPLY BRAKE
TAKE-UP BRAKE
TAKE-UP BRAKE
MAIN SLIDE PLATE
REEL GEAR (T)
CAM GROOVE 3.
CAM SLIDE ASS'Y
ACT BRAKE LEVER
CAPSTAN MOTOR
REEL DRIVE BELT
ACT CLUTCH LEVER
BRAKE CONT. SLIDE
REEL GEAR (S)
CAPSTAN SOFT BRAKE
SUPPLY BRAKE
TAKE-UP BRAKE
REEL GEAR (T)
ACT BRAKE SLIDE

Fig. 2-8 CONSTRUCTION OF BRAKE CONTROL PLATE (AT BRAKE MODE)

2-2-5. Brake Lock Release Mechanism (FF/REW→STOP Mode)

The brake lock momentary release mechanism is shown in Fig. 2-9 ⓐ, ⓑ and Fig. 2-10.
In the FF/REW mode (Fig. 2-9 ⓐ) mechanical elastic load is given to the BRAKE LOCK LEVER mounted on the BRAKE CAM SLIDE which causes the brake to operate, and it is locked to the high-speed rotary axle of the 1st reducing section of the loading motor.

ⓐ changes from brake mode or lock released state to FF/REW, STOP mode.

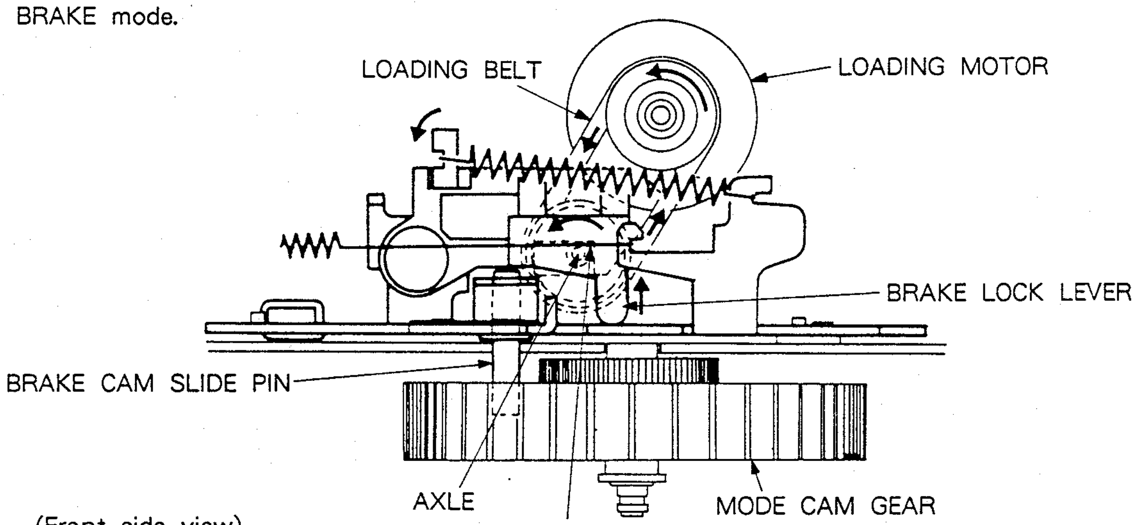

LOADING BELT
LOADING MOTOR
AXLE
BRAKE CAM SLIDE PIN
BRAKE LOCK LEVER
MODE CAM GEAR

(Front side view)

Fig. 2-9 ⓐ BRAKE LOCK & RELEASE MECHANISM

At the time of a shift to the STOP mode from the FF/REW (Fig. 2-9 ⓑ), the BRAKE LOCK LEVER releases the lock on slight rotation of the axle by contact between the rotary shaft and the friction resistance so that the brake can be instantaneously applied to the reel. The lock release speed is almost the same as the start-up of the loading motor. So, the its response to the brake is very quick, and construction is simplified also.

ⓑ Changes from FF/REW, STOP mode to BRAKE mode.


LOADING BELT
LOADING MOTOR
BRAKE LOCK LEVER
BRAKE CAM SLIDE PIN
AXLE
MODE CAM GEAR

(Front side view)

Lock is released by the frictional resistance of an elastic load.

Fig. 2-9 ⓑ BRAKE LOCK & RELEASE MECHANISM

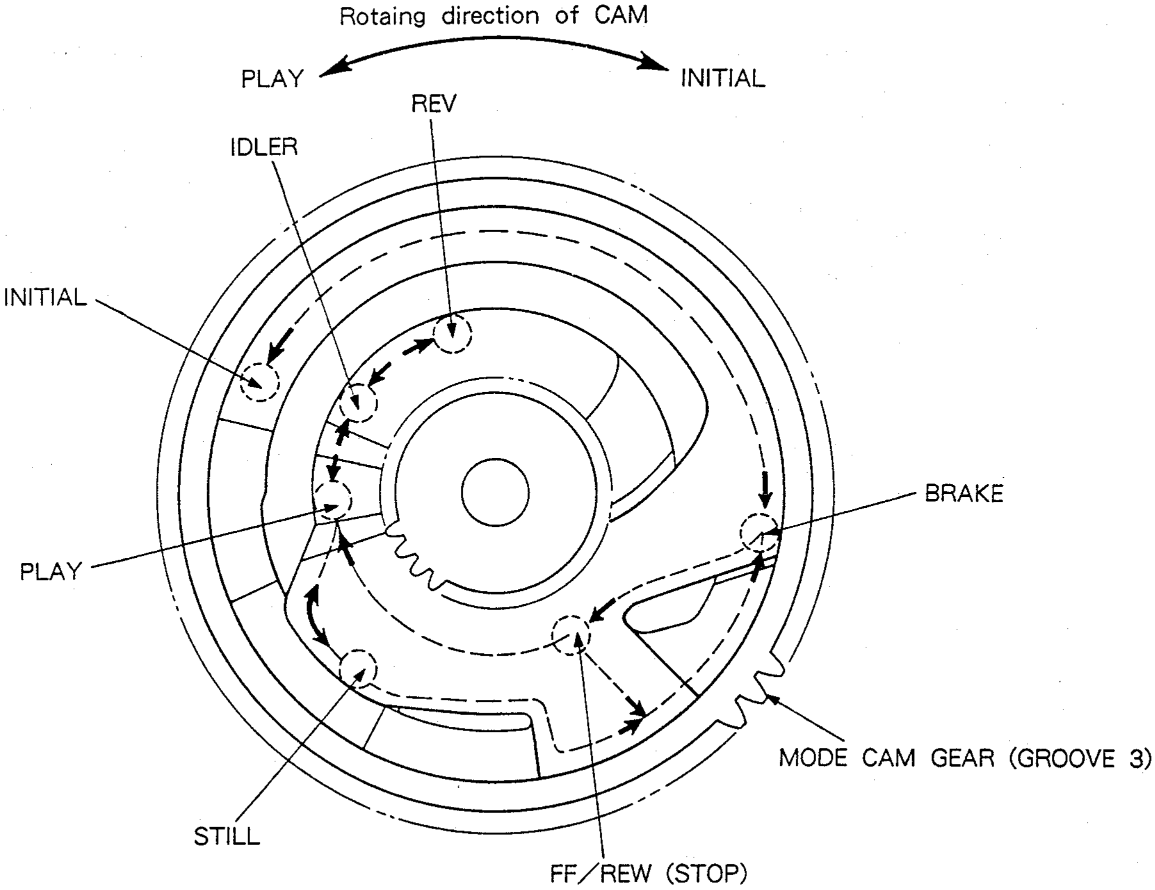
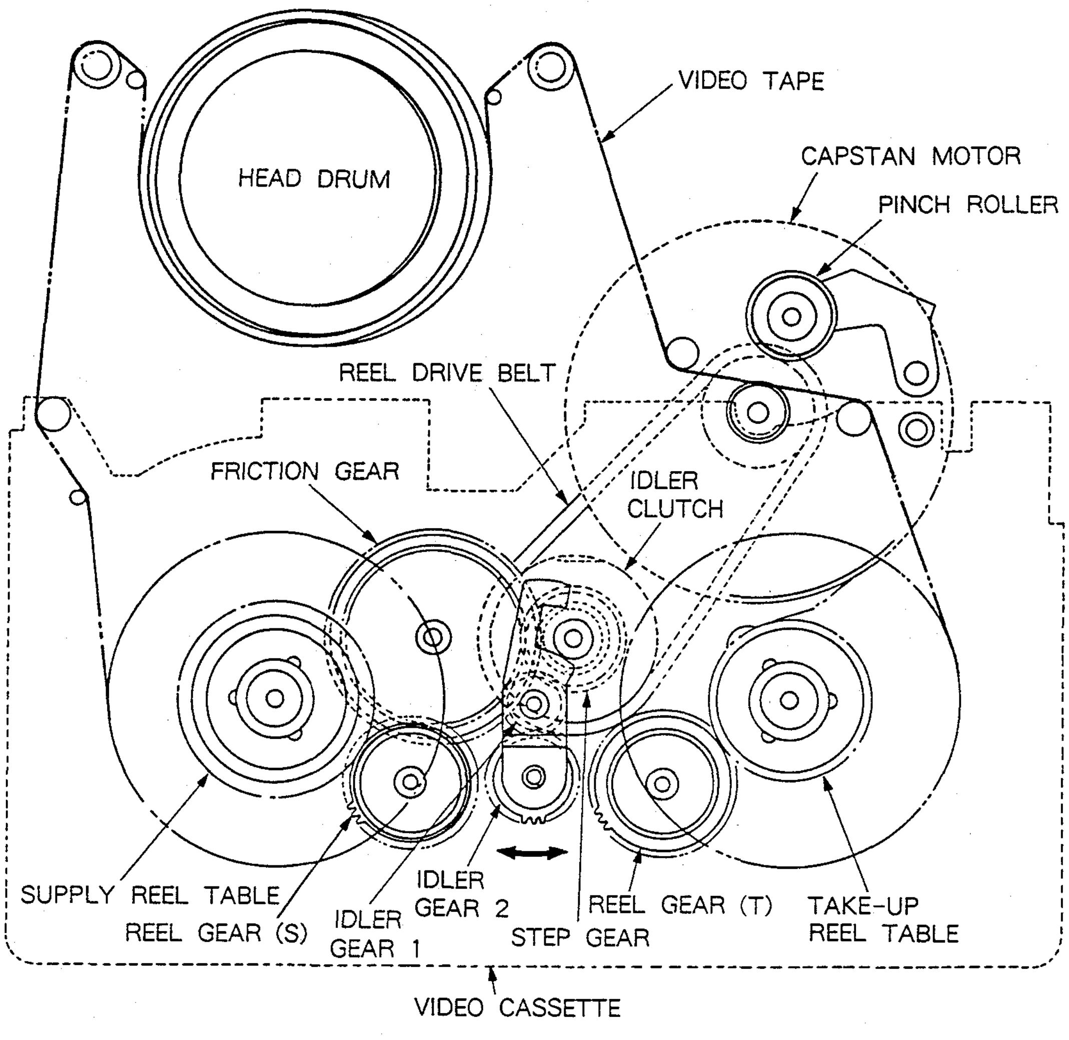

Rotaing direction of CAM
PLAY
INITIAL
REV
IDLER
INITIAL
BRAKE
PLAY
MODE CAM GEAR (GROOVE 3)
STILL
FF／REW (STOP)

Fig. 2-10 POSITIONING OF BRAKE CAM SLIDE-PIN ON THE GROOVE 3 OF MODE CAM GEAR

2-3. REEL TABLE DRIVE

2-3-1. Reel Table Drive Mechanism

This mechanism employs the system of driving the tape from the DD capstan motor via rubber belt. In the tape constant speed running mode for PLAY, F-SEARCH, and R-SEARCH, the capstan and the pinch roller are press-fitted to allow the tape to run at a constant speed. By providing a FRICTION MECHANISM in between the capstan motor and the reel table, the tape is taken up. In the FF/REW tape high-speed take-up mode, the capstan and the pinch roller are separated from each other, and the capstan motor and the reel table are linked direct by the clutch mechanism to carry out tape take-up. Also, to realize a thin type reel table drive section, the mechanism is simplified and the rotary parts are thinned for realization of physically compact design, and a step is provided on the reel table mounting section of the chassis by high-precision drawing process. A simplified figure of the drive mechanism is shown in Fig. 2-11 and Fig. 2-12. Power transmission to the pulley of the clutch mechanism section is done from the DD capstan motor via rubber belt.



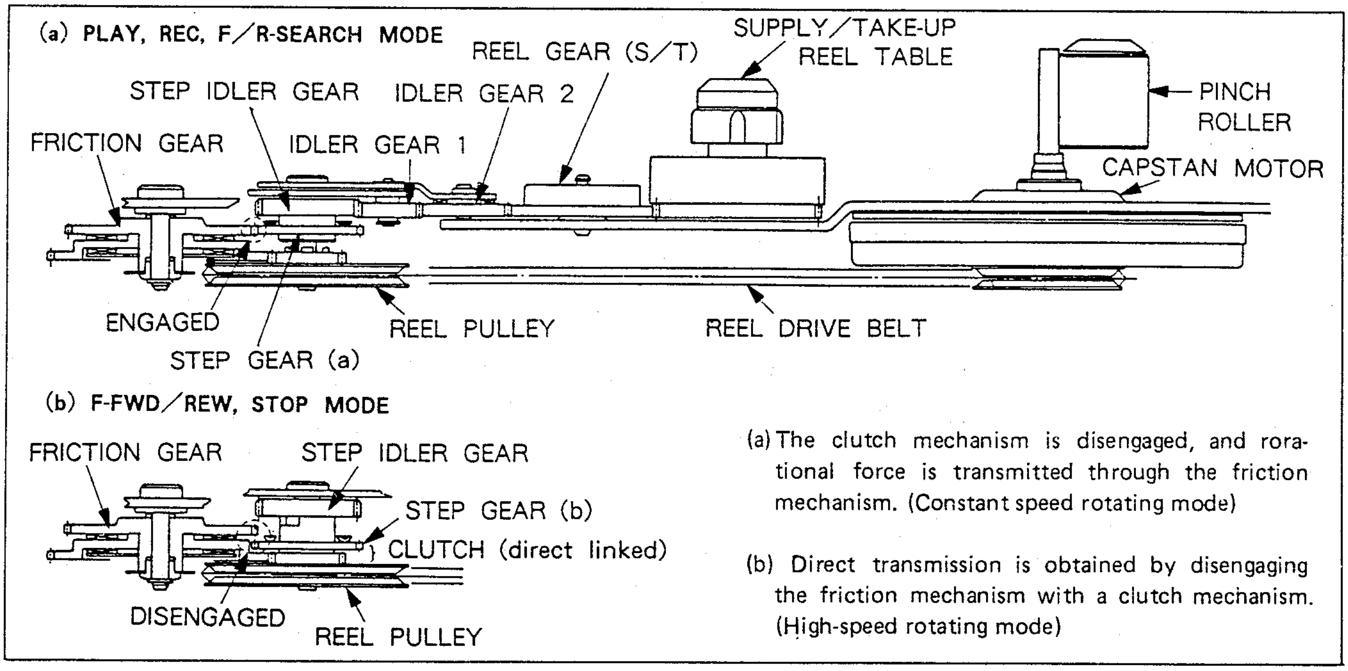
VIDEO TAPE
CAPSTAN MOTOR
PINCH ROLLER
HEAD DRUM
REEL DRIVE BELT
FRICTION GEAR
IDLER CLUTCH
SUPPLY REEL TABLE
REEL GEAR (S)
IDLER GEAR 1
IDLER GEAR 2
STEP GEAR
REEL GEAR (T)
TAKE-UP REEL TABLE
VIDEO CASSETTE

Fig. 2-11 REEL TABLE DRIVE

At that time, the reel table winding speed and the torque needed in a wide variety of modes are obtained by shifting the up and down STEP GEAR positioned at the upper section of pulley. The selection of the STEP GEAR is precision controlled by the MODE CAM GEAR via the BRAKE CONTROL SLIDE. With the up and down STEP GEAR down, the clutch mechanism is direct linked, and the transmission power from the capstan motor is sent to the reel table via IDLER GEAR assembly and REEL GEAR (S/T). On the other hand, FRICTION MECHANISM acts between the pulley and the STEP GEAR when the up and down STEP GEAR are in the elevated state, thereby controlling the transmission torque for generation of the take-up slip. Normally, it is desirable that the take-up torque of the reel table is higher in the R-SEARCH mode than that in the PLAY mode. This is because in the forward tape running the tape winding load to the HEAD DRUM has to be taken care of the capstan and the pinch roller.
While, in the reverse tape running mode the winding load has to be taken on the take-up reel table. In the special playback operation, a mechanism for varying the take-up torque of the reel table is required to be changed depending upon the running direction of the tape. But in this mechanism, the torque selection is made by varying the reduction speed ratio up to the reel table from the capstan motor on both the forward side and the reverse side of the tape. Also, design simplification of the selection mechanism is realized by using a single friction mechanism. In other words, the take-up torque necessary for forward/reverse rotation is obtained by controlling the capstan motor speed.

Rotation speed and torque needed for each mode of operation are converted by clutch mechanism for transmission of the drive power to the idler mechanism. The left and right moving IDLER GEAR assembly is automatically rotated to the left and the right according to the direction of capstan motor rotation by using the friction force. Because the mechanism is so designed as to drive the reel table of the side on which the tape is transported by the capstan and pinch roller, the forward and reverse constant speed drive (the PLAY, REC, F/R SEARCH modes) is carried out in the state in which the FRICTION MECHANISM is being operated (Fig. 2-12 ⓐ) On the other hand, in the condition in which the friction mechanism is not in operation, the forward/reverse high speed drive (FF/REW mode) is made possible (Fig. 2-12 ⓑ). Also, the reel drive in all modes is taken care of by the single left and right moving idler for design simplification.

The idler body employs gear drive to improve reliability with a view to realizing parts thinning while securing the transmission reliability. Using a resin molded gear as material of an idler, the efficiency of the entire reel drive system has been improved because there are no deformation and loss, and minimized rotation moving torque necessary for biting-in as in the case of a material such as rubber which shows considerable elastic deformation, etc. Further in this mechanism, an intermediate gear is provided in between the reel side and the idler to minimize the rotating and moving angle of the left and right moving idlers, thereby holding the reversing time to a minimum when shifting to the tape running direction change mode. This results in significantly reduced possibility of tape looseness.



(a) The clutch mechanism is disengaged, and roratâional force is transmitted through the friction mechanism. (Constant speed rotating mode)

(b) Direct transmission is obtained by disengaging the friction mechanism with a clutch mechanism. (High-speed rotating mode)

Fig. 2-12 REEL TABLE DRIVE (SIDE VIEW)

2-3-2. Reel Table Drive Clutch Lock and Release Mechanism

As described in the preceding section, using the selection of the step gear (CLUTCH MECHANISM), two mechanisms which are driven by being selected via direct drive or via FRICTION MECHANISM from the capstan motor, to execute the reel table drive. The operating status of the clutch lock and the releasing mechanism is shown in Fig. 2-13.

Fig. 2-13 ① shows the tape unloading position (INITIAL position) when the power for the mechanism operating mode is switched off.

At that times all the levers are in the initial positions, and the clutch is released also so that a route for reel table drive is created via a friction mechanism.

Fig. 2-13 ② shows that the mechanism operation mode has executed the tape loading and that it has completed its movement to the STOP (stand-by), FF/REW position.

At this time, the CLUTCH ACT LEVER is operated by the hook of the ACT BRAKE SLIDE to move the ACT CLUTCH LEVER in the direction of arrow via the CLUTCH LEVER and the CLUTCH CHANGE LEVER. Now, the up and down STEP GEAR is placed into the direct coupled state. In the FF/REW mode, the reel table is directly driven so that the rotation of the capstan motor is directly transmitted to make high-speed rotation drive possible. When shifting the mode to the STOP from the FF/REW in this condition, the mechanism mode position is once moved back to the brake position, and when the reel table brake is instantaneously applied, the clutch is released once at the same time, after which it returns to the same mechanism mode as the FF/REW mode once again. Now, it is placed in a waiting state in the same condition of the STOP mode as shown in Fig. 2-13 ②.

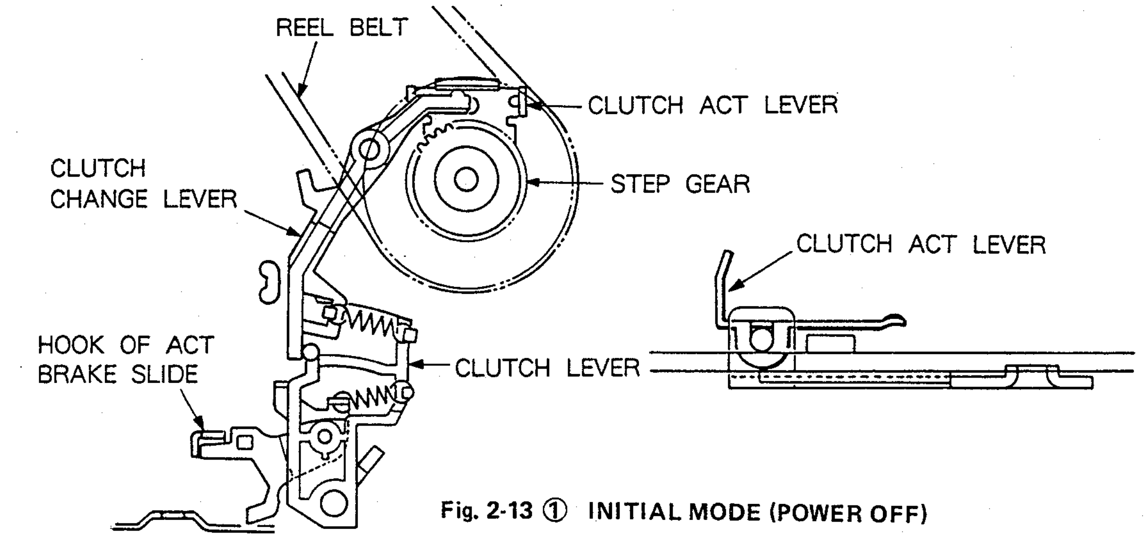

REEL BELT
CLUTCH ACT LEVER
CLUTCH CHANGE LEVER
STEP GEAR
CLUTCH ACT LEVER
HOOK OF ACT BRAKE SLIDE
CLUTCH LEVER

Fig. 2-13 ① INITIAL MODE (POWER OFF)

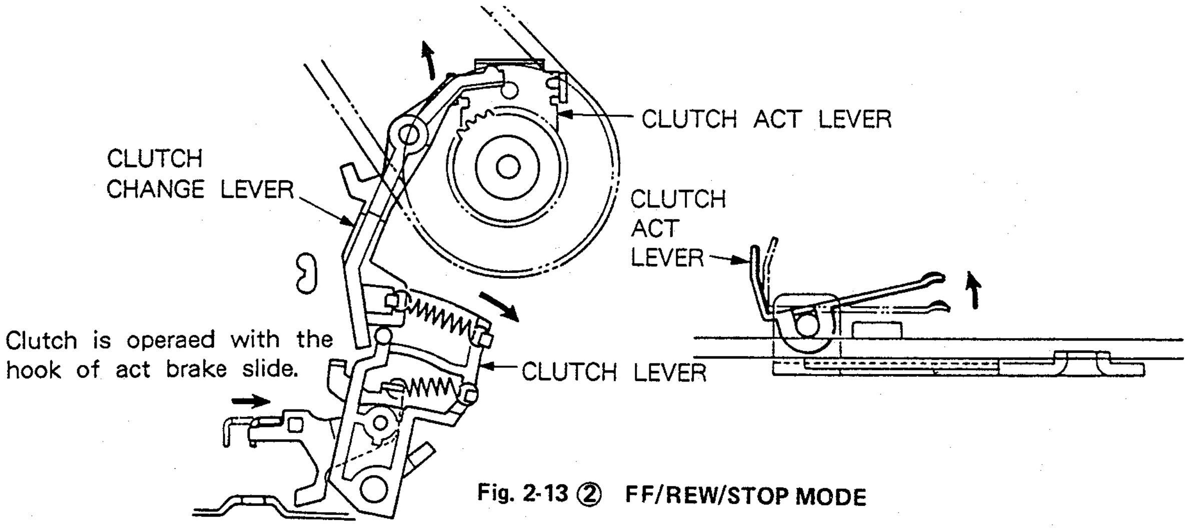

CLUTCH ACT LEVER
CLUTCH CHANGE LEVER
CLUTCH ACT LEVER
Clutch is operaed with the hook of act brake slide.
CLUTCH LEVER

Fig. 2-13 ② FF/REW/STOP MODE

Fig. 2-13 ① – ③ REEL TABLE DRIVE CLUTCH LOCK AND RELEASE MECHANISM

Fig. 2-13 ③ shows the completion state of a shift to the PLAY mode via the STILL mode from the STOP (FF/REW) mode for the mechanism mode position.

In the case of this mode shifting, the movement of the BRAKE ACT SLIDE remains fixed. So, the CLUTCH ACT LEVER should be unlocked by the movement of the hook of the MAIN SLIDE PLATE to cause the clutch to be released. This movement in turn causes the capstan motor rotation to be transmitted via the friction mechanism. So, the constant speed rotation drive necessary for the PLAY (REC) mode and SEARCH mode is made possible.

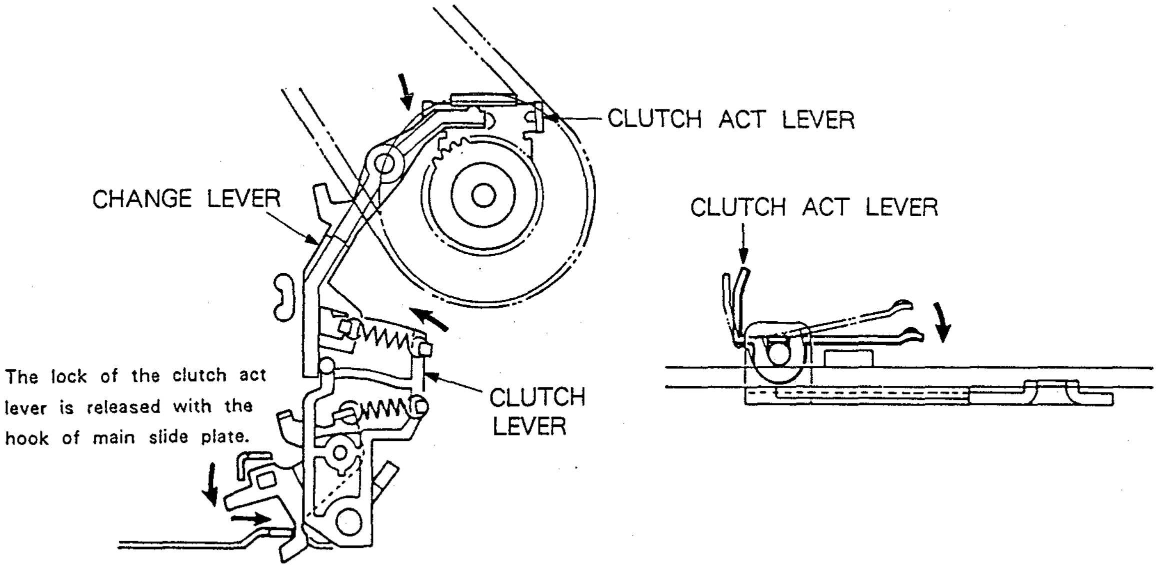

CLUTCH ACT LEVER
CHANGE LEVER
CLUTCH ACT LEVER
The lock of the clutch act lever is released with the hook of main slide plate.
CLUTCH LEVER

Fig. 2-13 ③ FF/REW/STOP MODE → STILL MODE → PLAY MODE

2-4. FRONT LOADING DRIVE SELECTION MECHANISM

In the P-90 mechanism, the motor dedicated to the use of front loading is not employed. The drive source is utilized instead of the tape loading motor. As shown in Fig. 2-14 ⓐ/ⓑ, during the front loading the FRONT LOAD WORM GEAR directly coupled to the tape loading motor axle and the FRONT HELICAL GEAR with several teeth missing are engaged with each other and rotated for transmission of the drive force to the front loading mechanism. When the cassette tape is inserted completely in the mechanism, the FRONT HELICAL GEAR is automatically disengaged from the FRONT LOAD WORM GEAR. After that, the tape loading operation is performed without the tape loading motor drive force being transmitted to the front loading mechanism.

While the drive force is being transmitted to the front loading mechanism, the CAM GROOVEs of the before-mentioned MAIN CAM GEAR and the MODE CAM GEAR are flat in cam line pattern. These are therefore held without changing the mode state of the mechanism in any way.

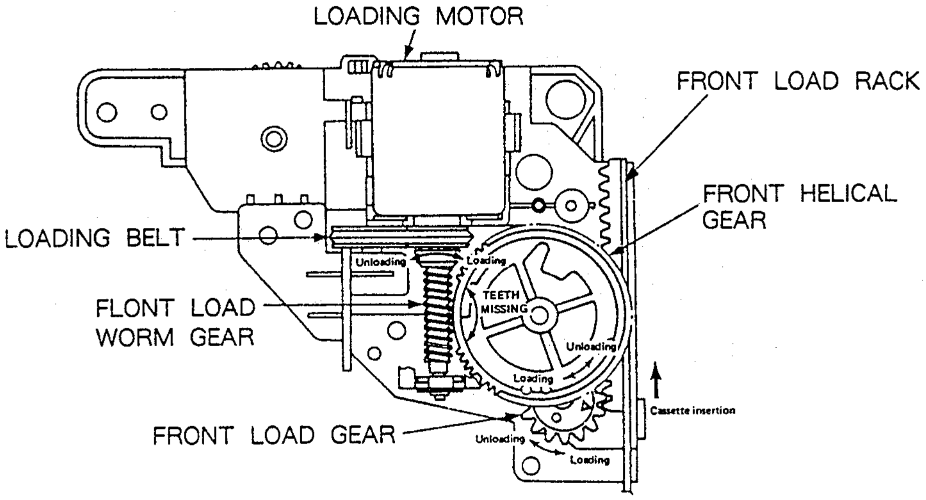

LOADING MOTOR
FRONT LOAD RACK
FRONT HELICAL GEAR
LOADING BELT
FLONT LOAD WORM GEAR
Unloading
Loading
TEETH MISSING
Unloading
Loading
Cassette insertion
FRONT LOAD GEAR
Unloading
Loading

Fig. 2-14 ⓐ **FRONT LOADING DRIVE SELECTION MECHANISM (CASSETTE INSERTED POSITION)**

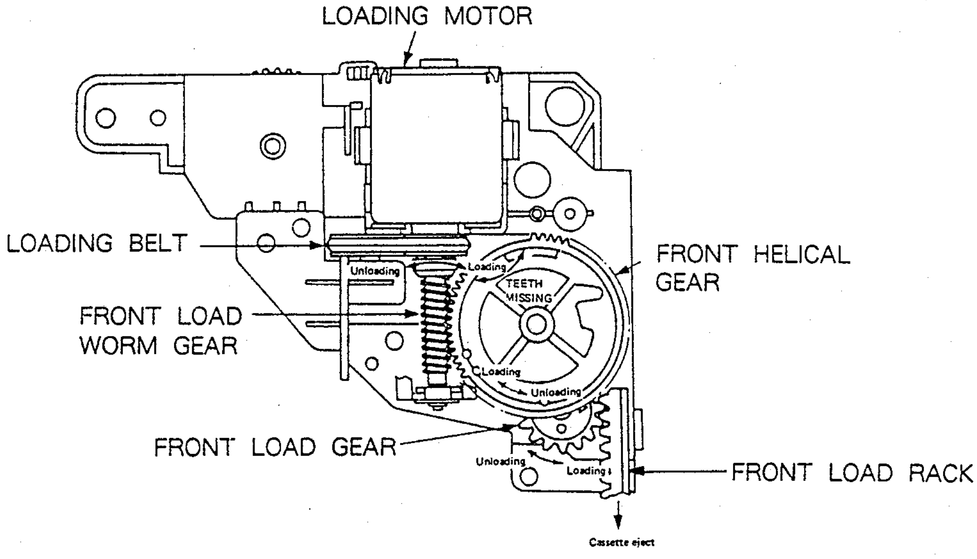

LOADING MOTOR
LOADING BELT
FRONT HELICAL GEAR
Unloading
Loading
TEETH MISSING
FRONT LOAD WORM GEAR
Loading
Unloading
FRONT LOAD GEAR
Unloading
Loading
FRONT LOAD RACK
Cassette eject

Fig. 2-14 ⓑ **FRONT LOADING DRIVE SELECTION MECHANISM (CASSETTE EJECTED POSITION)**

(A) Cassette inserting operation

When inserting a cassette from the cassette ejected state of Fig. 2-14 ⓑ, the FL START SWITCH shown in Fig. 2-15 is turned OFF, to cause the loading motor to be rotated in the direction of insetting. As a result, the FRONT LOAD RACK is drawn in, and the front loading is made up to the cassette tape completion point. So, it is locked in the grooves shown in Fig. 2-15 to complete cassette inserting. At that time, the FRONT HELICAL GEAR is positioned at ⓐ of Fig. 2-14, and is released from the front loading mechanism, therefore, the tape loading operation is continuously performed.

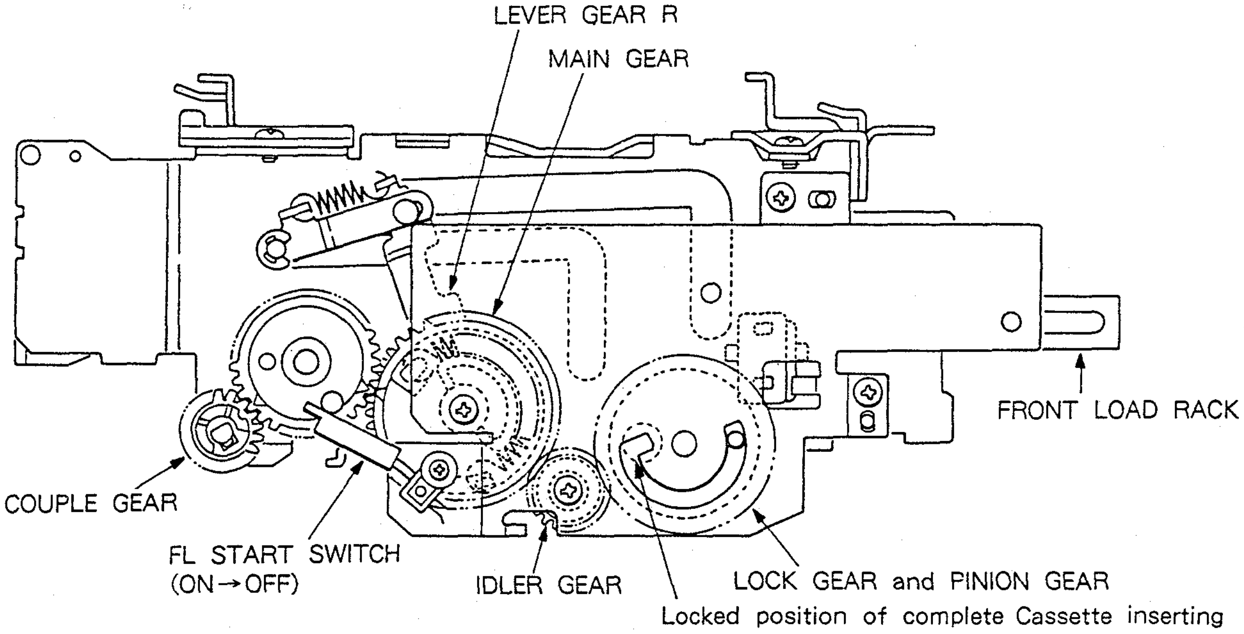

LEVER GEAR R
MAIN GEAR
FRONT LOAD RACK
COUPLE GEAR
FL START SWITCH
(ON→OFF)
IDLER GEAR
LOCK GEAR and PINION GEAR
Locked position of complete Cassette inserting

Fig. 2-15 CASSETTE HOLDER MECHANISM (CASSETTE INSERTING OPERATION)

(B) Cassette ejection operation

The components of the front loading mechanism is shown in Fig. 2-16.

When ejecting the cassette from the inserted state shown in Fig. 2-14 ⓐ, the FRONT ACT LEVER is pushed in the direction of arrow due to the ACT SLIDE PLATE moves in the direction of arrow shown in Fig. 2-17. As a result, the FRONT LEVER assembly is turned counterclockwise via the FRONT LOAD SLIDE to cause the FRONT HELICAL GEAR to be engaged with the FRONT LOAD WORM GEAR of the loading motor. At that time, the loading motor is being rotated counterclockwise, so that the FRONT HELICAL GEAR is caused to be rotated counterclockwise also to carry out the front unloading via the FRONT LOAD GEAR and the FRONT LOAD RACK. At the same time, the FRONT ACT LEVER is operated counterclockwise by the hook of the FRONT HELICAL GEAR. This releases the lock being pushed in the direction of arrow indicated by the ACT SLIDE PLATE. So, the FRONT LOAD SLIDE assembly now moves to the initial position to prepare for the next ejection operation. Incidentally, the movement of the FRONT LEVER assembly performs an important function of positioning the FRONT HELICAL GEAR (Fig. 2-14 ⓐ) upon completion of cassette mounting, in addition to the cassette eject start-up operation.

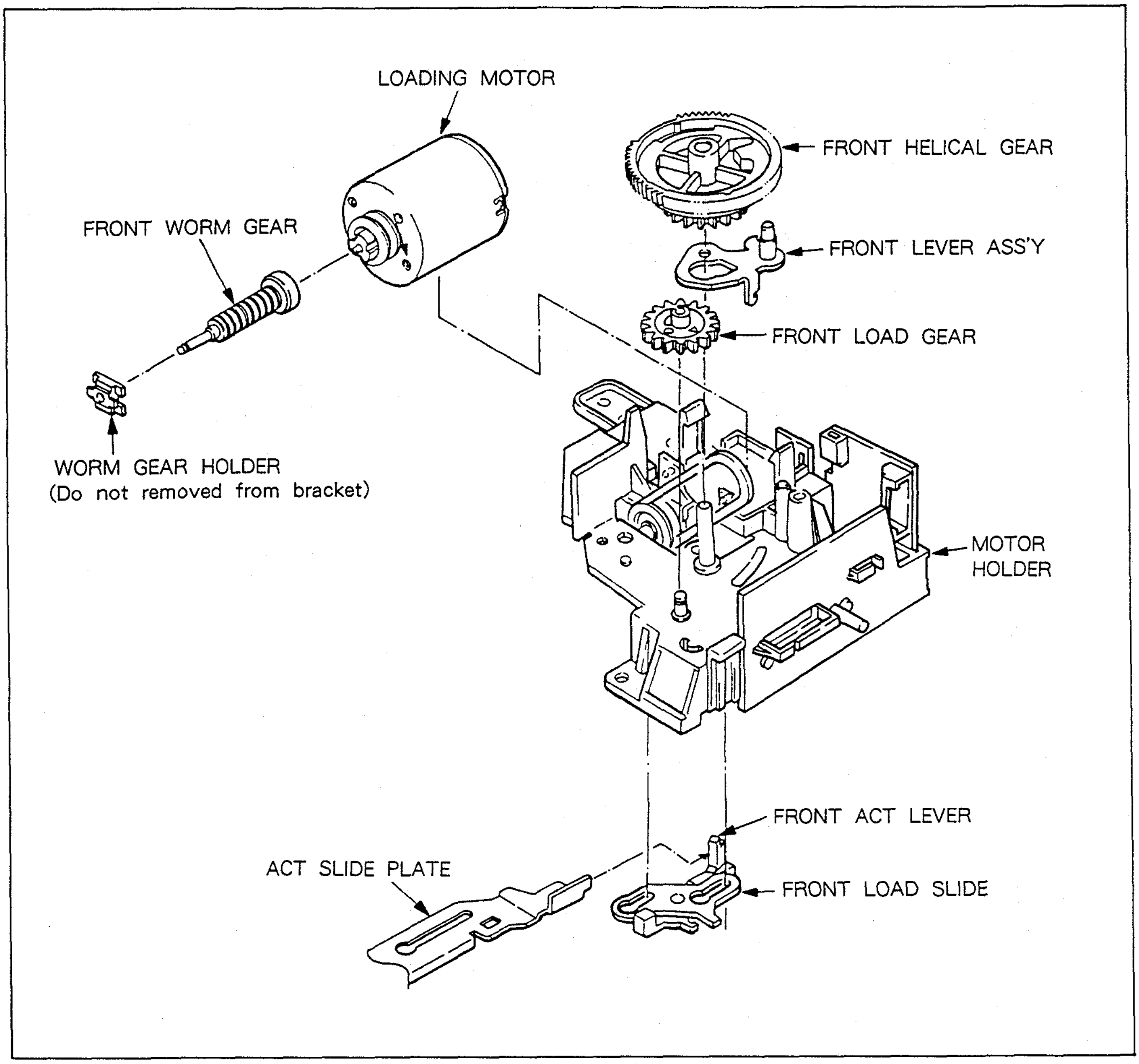
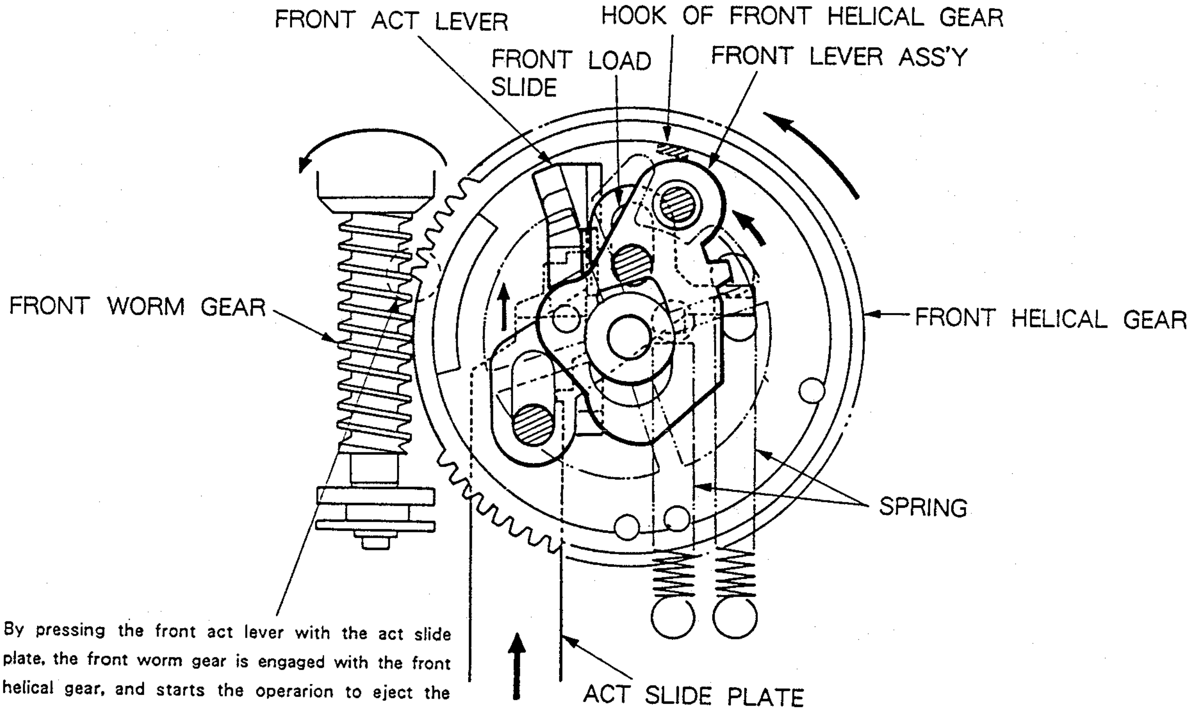

LOADING MOTOR
FRONT HELICAL GEAR
FRONT WORM GEAR
FRONT LEVER ASS'Y
FRONT LOAD GEAR
WORM GEAR HOLDER
(Do not removed from bracket)
MOTOR HOLDER
FRONT ACT LEVER
ACT SLIDE PLATE
FRONT LOAD SLIDE

Fig. 2-16 FRONT LOADING DRIVE SELECTION MECHANISM


FRONT ACT LEVER
HOOK OF FRONT HELICAL GEAR
FRONT LOAD SLIDE
FRONT LEVER ASS'Y
FRONT WORM GEAR
FRONT HELICAL GEAR
SPRING
ACT SLIDE PLATE

By pressing the front act lever with the act slide plate, the front worm gear is engaged with the front helical gear, and starts the operarion to eject the cassette.

Fig. 2-17 CASSETTE EJECTION START OPERATION (See through top view)

2-5. CASSETTE HOLDER MECHANISM

2-5-1. Components

The exploded view of the cassette holder mechanism is shown in Fig. 2-18. This mechanism consists of a cassette tray for feeding the cassette tape to the specified position of the mechanism chassis, a side plate provided with L type holes for supporting and guiding it, the top plate for regulating the width of left and right, and a group of gears for driving the cassette tray.
The entire mechanism is of independent construction apart from the mechanism body. The holder is fixed on the mechanism chassis by inserting the pawls at two points and tightening the setscrews at two points, or at a total of four points.

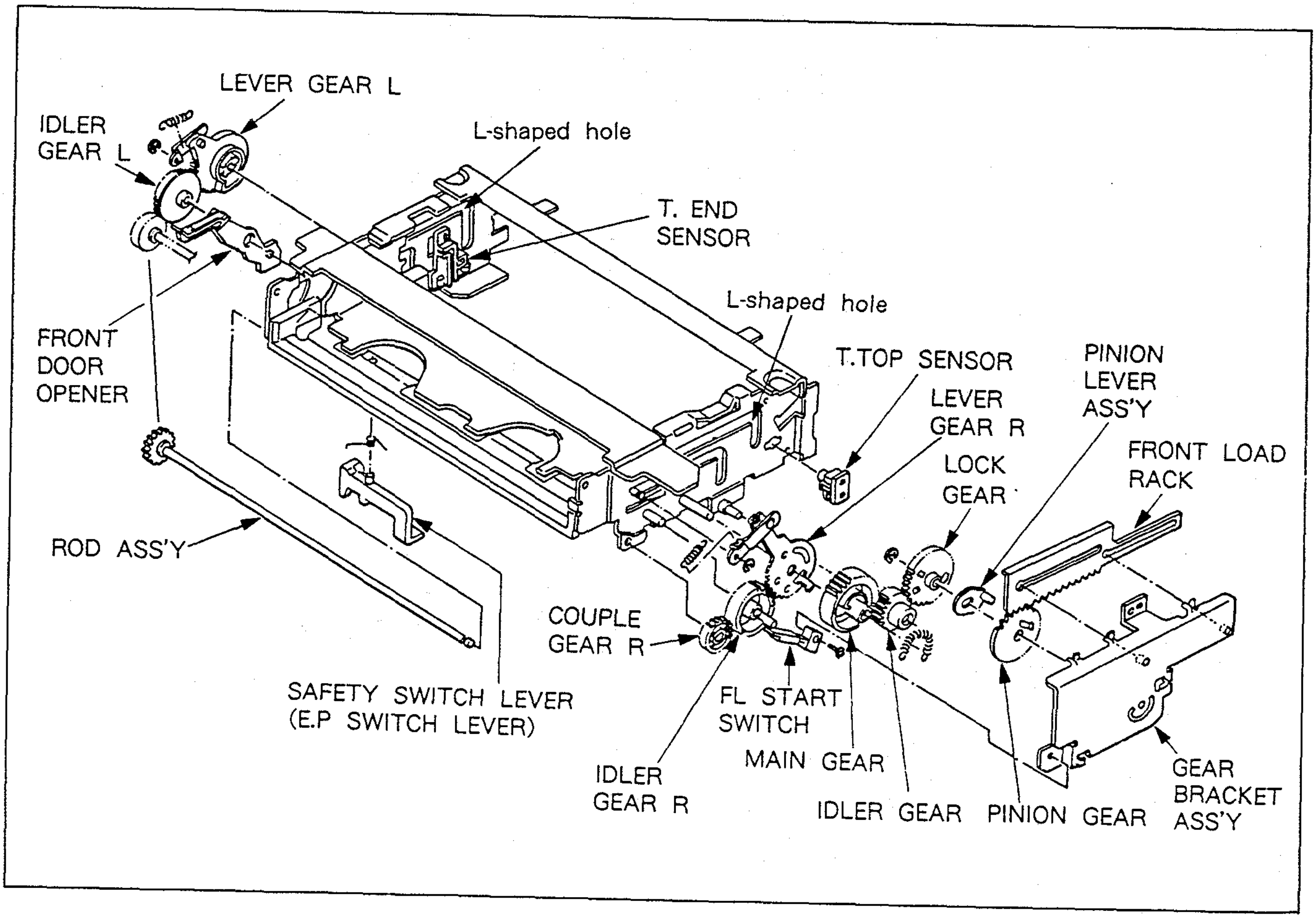

LEVER GEAR L
IDLER GEAR L
L-shaped hole
T. END SENSOR
L-shaped hole
FRONT DOOR OPENER
T.TOP SENSOR
PINION LEVER ASS'Y
LEVER GEAR R
LOCK GEAR
FRONT LOAD RACK
ROD ASS'Y
COUPLE GEAR R
SAFETY SWITCH LEVER (E.P SWITCH LEVER)
FL START SWITCH
MAIN GEAR
IDLER GEAR R
IDLER GEAR
PINION GEAR
GEAR BRACKET ASS'Y

Fig. 2-18 EXPLODED VIEW OF THE CASSETTE HOLDER MECHANISM

2-5-2. Description of Cassette Holder

The cassette holder is of motor-less design, as the lowering of mechanism height and driving source are done by the loading motor of the mechanism body.

As a substitute for the worm gear system hitherto used in the major drive section for the drive selection mechanism mentioned in section 2-4., the RACK LOADING system is adopted in this cassette holder mechanism. By this mechanism the motor-less design can be realized. An exploded view of the mechanism is shown in Fig. 2-19. A description of the operation is made below along with Fig. 2-19.

To press-fit the cassette tape after sending it onto the mechanism chassis, the PINION GEAR section is triple construction. The FRONT LOAD RACK side and the IDLER GEAR side are independently engaged. The PINION GEAR and the LOCK GEAR are connected from the PINION LEVER PIN riveted to the PINION LEVER. Even after feeding the cassette tape to the specified position of the mechanism chassis, the FRONT LOAD RACK slides, giving the rotation to the PINION GEAR which is engaged with the FRONT LOAD RACK. At that time, a pin is dropped into the groove section provided on the GEAR BRACKET ASS'Y.

The other LOCK GEAR is fixed by this PINION LEVER PIN, and the cassette tape is press-fitted onto the mechanism chassis by linked IDLER GEAR.

The before-mentioned FRONT LOAD RACK and the PINION GEAR are set free after dropping the PINION LEVER PIN into the groove section. So, the drive force of the loading motor is sent to the mechanism body.

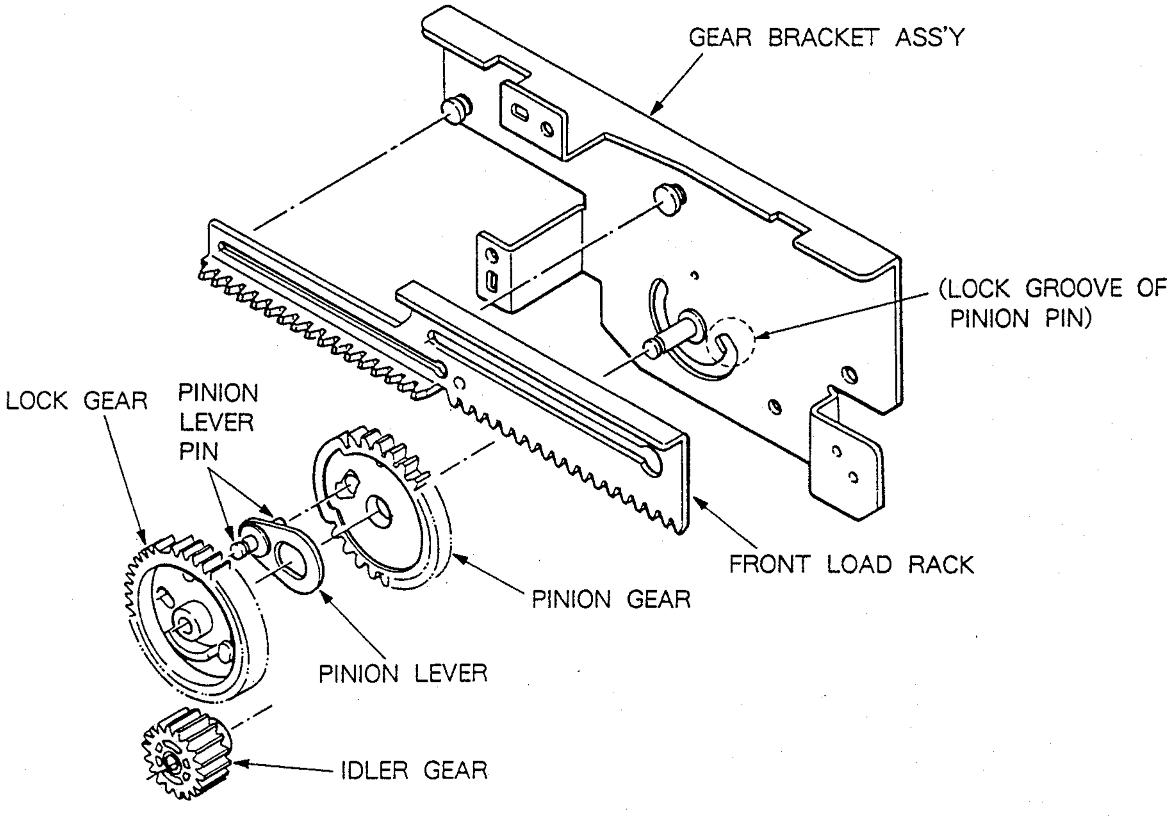


Fig. 2-19 RACK LOADING MECHANISM OF CASSETTE HOLDER

3. MECHANISM CONTROL

3-1. MODE ARRANGEMENT

This mechanism is arranged in such a mode layout as shown in Table. 3-1 and as described in section 2-1. The mode sensing switch described below is used for control of these modes.

3-2. MODE DETECTION SWITCH

For mode detecting one leaf switch (FL START SWITCH and one rotary switch (MECHANISM MODE SWITCH) are used in combination.

Mechanism Mode	Mechanism Mode Switch			HEX DATA	Function	Main Mode Shifting Conditions	VTR Operation Mode
	3	2	1				
EJECT	–	–	–		Eject position		EJECT
					Front loading/Unloading		
SHORT REW	–	–	–		Take up operation in the tape end position		Low side of ⑥. Sensed upon IN
INITIAL	1	1	1	⑦	Power off position		Power off when tape is loaded completely
					Tape unloading position Tape loading Tape loading ending position		
BRAKE	0	0	1	①	Main brake applying position		
STOP / FF/REW	0	1	0	②	STOP waiting and FF/REW (the head motor rotation)		STOP, FF/REW
STILL	0	1	1	③	The positions of STILL, SLOW or F-ADV.		STILL, SLOW, F-ADV
PLAY	1	0	0	④	From FWD direction Normal running mode		PLAY, REC, F-SEARCH
IDLER	1	0	1	⑤	Forward/reverse changeover position		PAUSE
REV	1	1	0	⑥	From REV direction Normal running mode		R-SEARCH

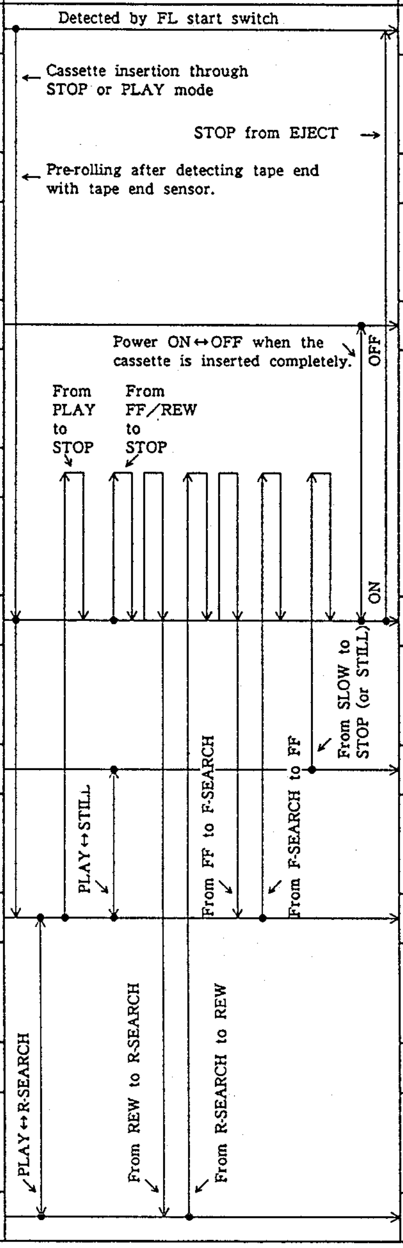

Detected by FL start switch
Cassette insertion through STOP or PLAY mode
STOP from EJECT
Pre-rolling after detecting tape end with tape end sensor.
Power ON↔OFF when the cassette is inserted completely.
OFF
ON
From PLAY to STOP
From FF/REW to STOP
From SLOW to STOP (or STILL)
PLAY↔STILL
From FF to F-SEARCH
From F-SEARCH to FF
PLAY↔R-SEARCH
From REW to R-SEARCH
From R-SEARCH to REW

Table 3-1

(1) Switch component
The mode switch consists of FL START SWITCH for detecting the cassette ejection and insertion, and MECHANISM MODE SWITCH for detecting the each mode position of the mechanism. As can be understood from Fig. 3-1, the MECHANISM MODE SWITCH rotates in excess of 360 degrees. Therefore, the sensing of a signal from the MECHANISM MODE SWITCH is done by the leaf switch.
In the P88 and P89 mechanisms, incidentally, short REW position is detected by the FL END SW, but in the P90 mechanism, the FL END SWITCH is not required due to a change in the internal structure of the MECHANISM MODE SWITCH.

(2) Mechanism mode switch
The mechanism mode switch consists of four terminals, namely, COM, DATA1, DATA2, and DATA3. These are processed as 3-bit signals for discrimination of seven modes.
The MECHANISM MODE SWITCH is not interchangeable with the hither to available black switch due to a change in its internal structure. Be sure therefore to use a blue switch.

3-3. CONSIDERATION TO FULL LOADING

① In the normal stop condition, the head drum is rotated to facilitate the start-up of the image at the time of playback, but it is conceivable that this is left undisturbed for an extended period of time. This may result in wear of the video head. For this reason, when five minutes elapse from the stop condition, the head drum stops rotating.

② To prevent the tape from being caught in the head drum due to dew forming, etc., the tape is housed in the unloaded cassette when turning the power off.

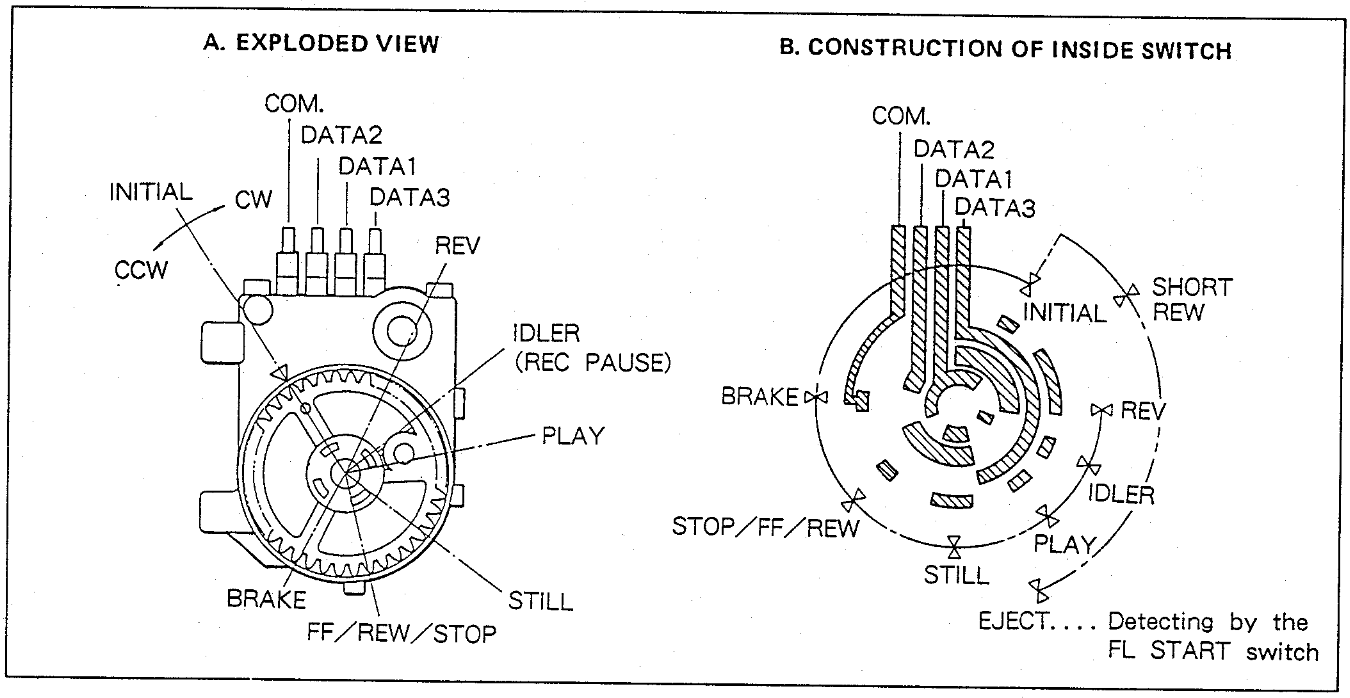

A. EXPLODED VIEW
COM.
DATA2
DATA1
DATA3
INITIAL
CW
CCW
REV
IDLER
(REC PAUSE)
PLAY
BRAKE
STILL
FF/REW/STOP
B. CONSTRUCTION OF INSIDE SWITCH
COM.
DATA2
DATA1
DATA3
INITIAL
SHORT
REW
BRAKE
REV
IDLER
STOP/FF/REW
PLAY
STILL
EJECT.... Detecting by the
FL START switch

Fig. 3-1 MECHANISM MODE SWITCH (ROTARY SWITCH)

4. MECHANISM MAINTENANCE AND CHECKING

4-1. PERIODIC CHECKING AND MAINTENANCE ITEMS AND SERVICE JIGS

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also, these procedures should always be followed after repairing the unit.

4-1-1. Periodic Check Items

○ Cleaning ◎ Confirmation △ Lubrication

Part	Usage Time (hours)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape Guide System	Tape running surfaces	○	○	○	○	○	○	○	○	○	○	
	ACE head	○	○	○	○	○	○	○	○	○	○	
	Drum (cylinder)	○	○	○	○	○	○	○	○	○	○	Head life depends heavily on operating conditions.
Drive System	Loading belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Reel drive belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Intermediate gear, pulley axles		△		△		△		△		△	Absolutely avoid oil on tape running surfaces.
	Capstan axles		△		△		△		△		△	
	Loading motor		◎		◎		◎		◎		◎	
Perfor-mance Check	Back tension torque		◎		◎		◎		◎		◎	47 ± 5 gcm
	Brake system		◎		◎		◎		◎		◎	
	FF, REV, PLAY torque		◎		◎		◎		◎		◎	FF : 600 gcm and over REW : 750 gcm and over REV : 150 to 240 gcm PLAY : 100 to 160 gcm

Note : The back tension torque is the value that has been measured by the cassette torque meter (VHJ-0016).
The torque of FF, REV, REW, and PLAY represent those measured with them locked by the torque gauge.
FF and REW are values 2 seconds after starting.

4-1-2. Cleaning

① Drum (COMPL. CYLINDER) and Video Heads (See Fig. 4-1-1.)

1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
2) Move the chamois leather to left and right several times on the video head to clean. There is a video head also on the opposite side, so clean it likewise. In Hi-Fi models, clean the audio head also.
3) Clean the tape path surface of the cylinder in the same way.

Note : Always turn power off before cleaning. Do never move the chamois leather vertically or apply too much force to the head ; it may be damaged.

② Cleaning of the Tape Guide System (See Fig. 4-1-2.)

1) Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note : Make sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

③ Cleaning of the Drive System

1) Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

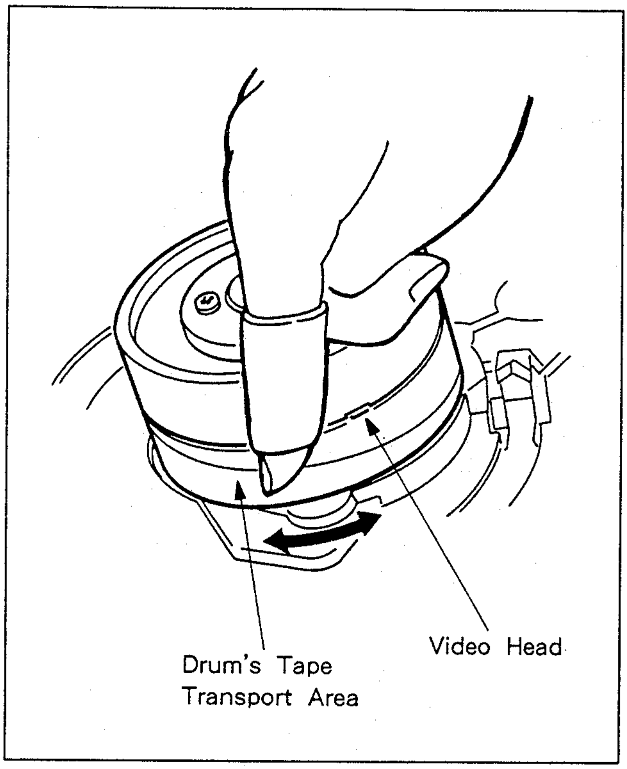

Drum's Tape Transport Area
Video Head

Fig. 4-1-1.

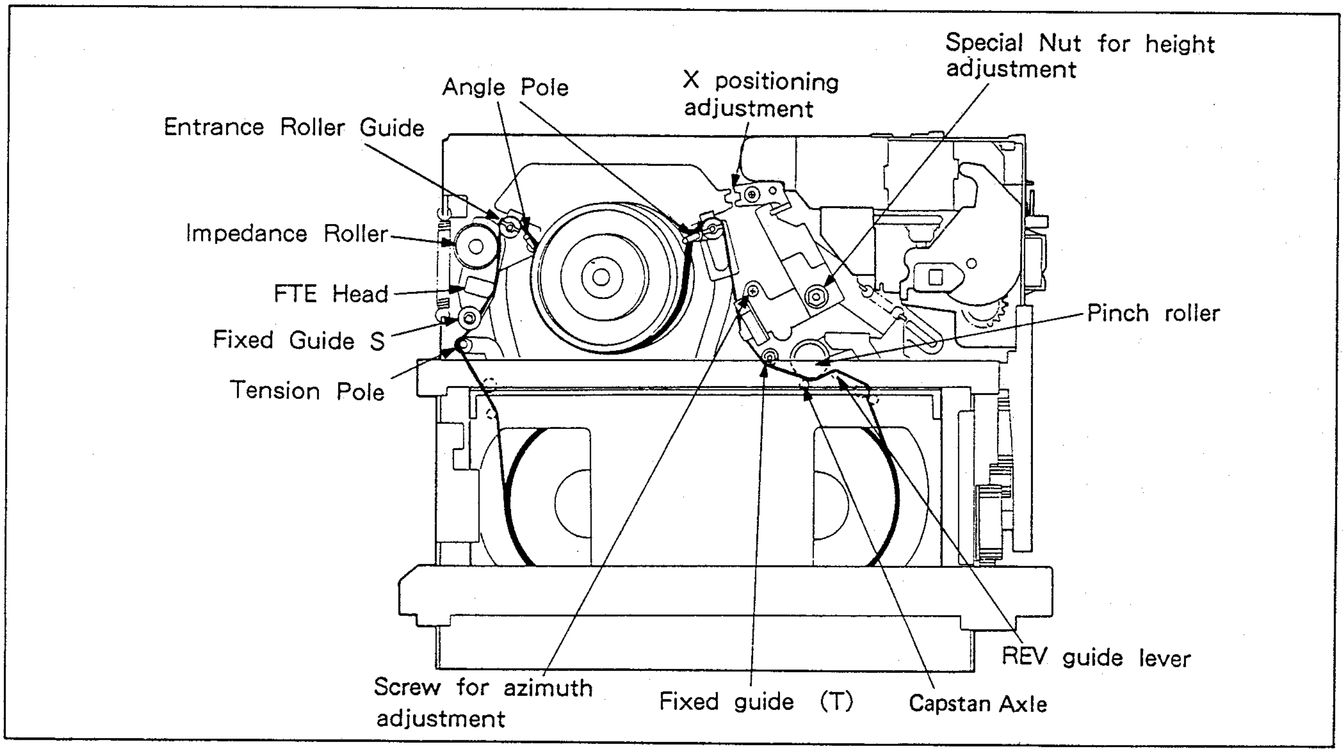
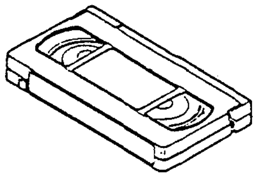

Angle Pole
X positioning adjustment
Special Nut for height adjustment
Entrance Roller Guide
Impedance Roller
FTE Head
Fixed Guide S
Tension Pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Fixed guide (T)
Capstan Axle

Fig. 4-1-2. Cleaning

4-1-3. Service Jigs

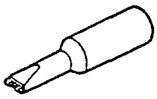
No.	Jig	Jig No.	Remarks
1	Alignment tape	VHJ-0008	SP color bar, 1kHz (normal)
2	Alignment tape	VHJ-0009	SP monoscope, 7kHz (normal)
3	Alignment tape	VHJ-0052	LP monoscope, 3kHz (normal)
4	Eccentric screwdriver	VHJ-0003	For tape path adjustment
5	Nut box	VHJ-0048	For tape path adjustment
6	Torque gauge	VHJ-0004	For reel take-up torque measurement
7	Cassette torquemeter	VHJ-0016	For back tension torque measurement
8	Position adjustment gauge	VHJ-0049	For position adjustment
9	Torque gauge screwdriver	VHJ-0014	For screw fastening torque adjustment
10	3mm dia. bit for torque screwdriver	VHJ-0045	Spare bit for the torque gauge screwdriver
11	Video head removing tool	VHJ-0041	For upper drum removal
12	Cassette stand plate gauge	VHJ-0001	For reel height adjustment
13	Mode selector	VHJ-0050	For mechanism mode selection
14	26-pin flexible flat cable	VHJ-0064	Spare cable for mode selector
15	Mode selector relay board	VHJ-0075	Relay board for mode selector
16	7-wire flat cable	VHJ-0076	Spare cable for relay board
17	REV guide lever removing tool	VHJ-0073	For REV guide lever removal
18	Fixed guide height gauge	VHJ-0053	For fixed guide (S) hight adjustment

VHJ-0008, VHJ-0009, VHJ-0052



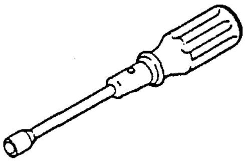
No. 1, 2, 3

VHJ-0003



No. 4

VHJ-0048



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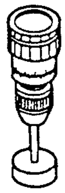

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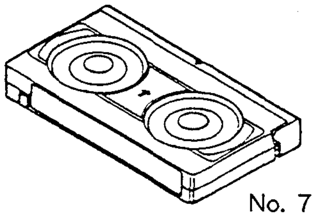
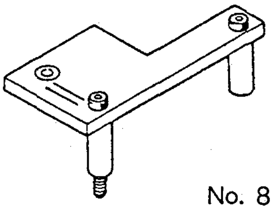
VHJ-0016



No. 7

VHJ-0049



No. 8

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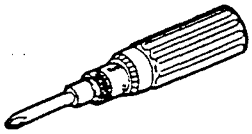

No. 9

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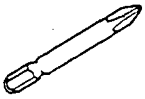

No. 10

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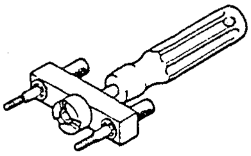
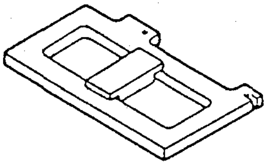


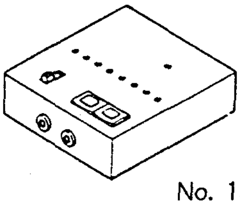
No. 11

VHJ-0001



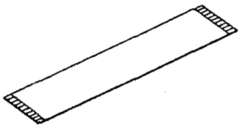
No. 12

VHJ-0050



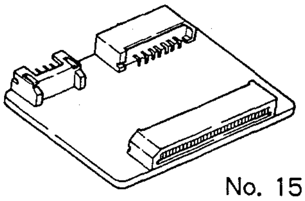
No. 13

VHJ-0064



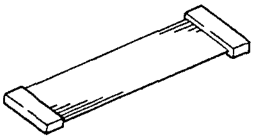
No. 14

VHJ-0075



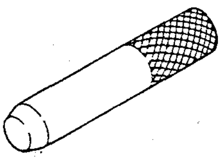
No. 15

VHJ-0076



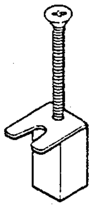
No. 16

VHJ-0073



No. 17

VHJ-0053



No. 18

4-2. MODE SELECTOR (VHJ-0050) HANDLING INSTRUCTIONS

The mode selector drives the loading motor of the P88 mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT⇔REV mode changes.
Instead of the internal batteries, an external DC 6V power supply can also be used.

4-2-1. Part Names (See Fig. 4-2-1)

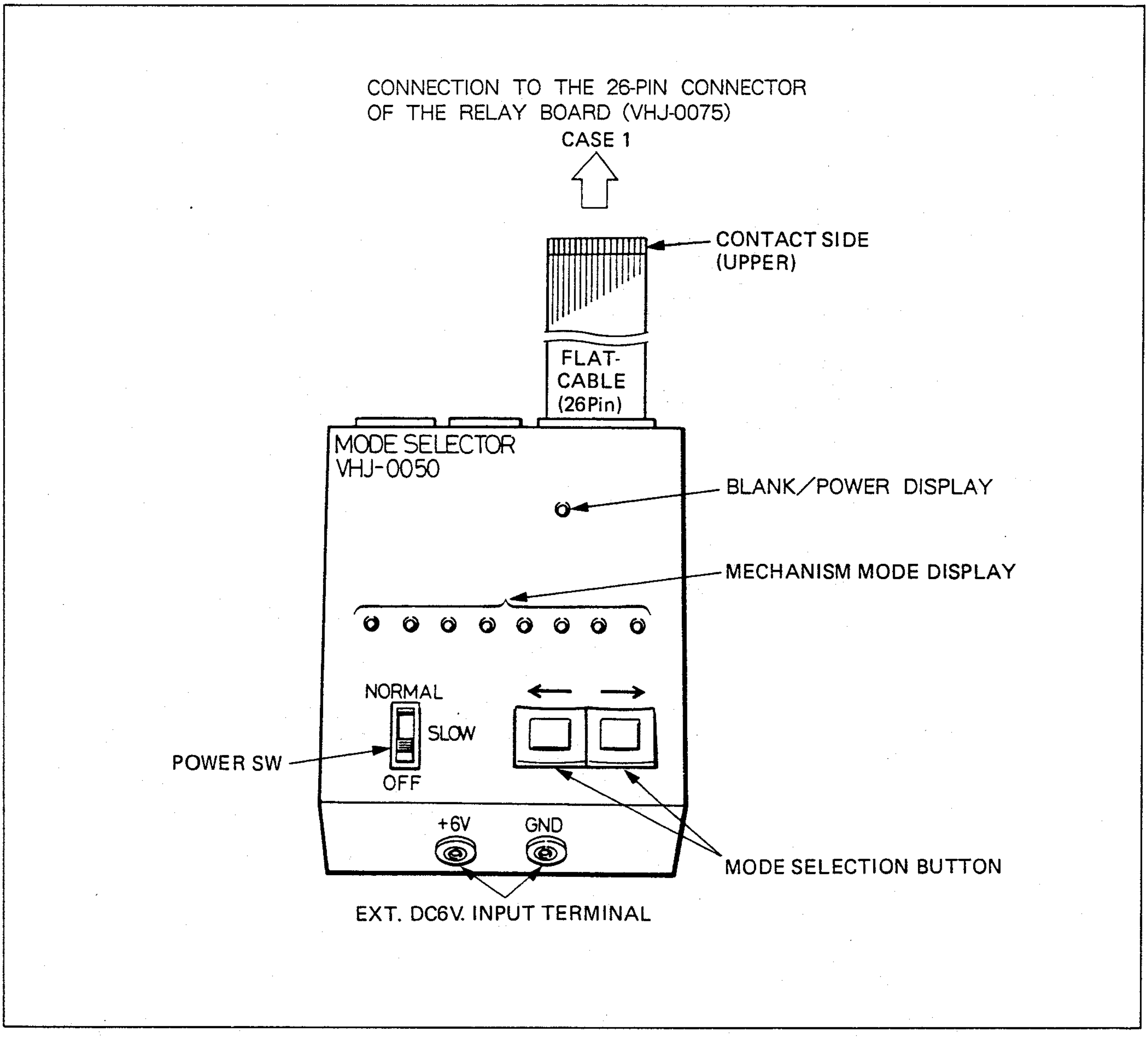

CONNECTION TO THE 26-PIN CONNECTOR
OF THE RELAY BOARD (VHJ-0075)
CASE 1
CONTACT SIDE (UPPER)
FLAT-CABLE (26Pin)
MODE SELECTOR VHJ-0050
BLANK/POWER DISPLAY
MECHANISM MODE DISPLAY
NORMAL
SLOW
OFF
POWER SW
←
→
MODE SELECTION BUTTON
+6V
GND
EXT. DC6V. INPUT TERMINAL

Fig. 4-2-1

4-2-2. Connection Method (See Fig. 4-2-2)

1) Remove the 7-wire cable connected from the system control circuit to the connector (CN822) of the MC-3 board.
2) Connect the 7-wire cable (VHJ-0076) between the connector (CN822) of the MC-3 board and the 7-pin connector of the Mode Selector Connection Board (VHJ-0075).
3) Remove the 6-wire cable extending from the cassette holder section from the connector of the System Control Circuit Board and connect it to the 6-pin connector of the Mode Selector Connection Board (VHJ-0075).
4) Connect a supplied 26-pin flat cable (VHJ-0064) of the mode selector (VHJ-0050) between the mode selector body and the 26-pin connector of the Connection Board (VHJ-0075).

Note : Care should be taken to avoid mistaking the direction of the contacting side when connecting a flexible flat cable.

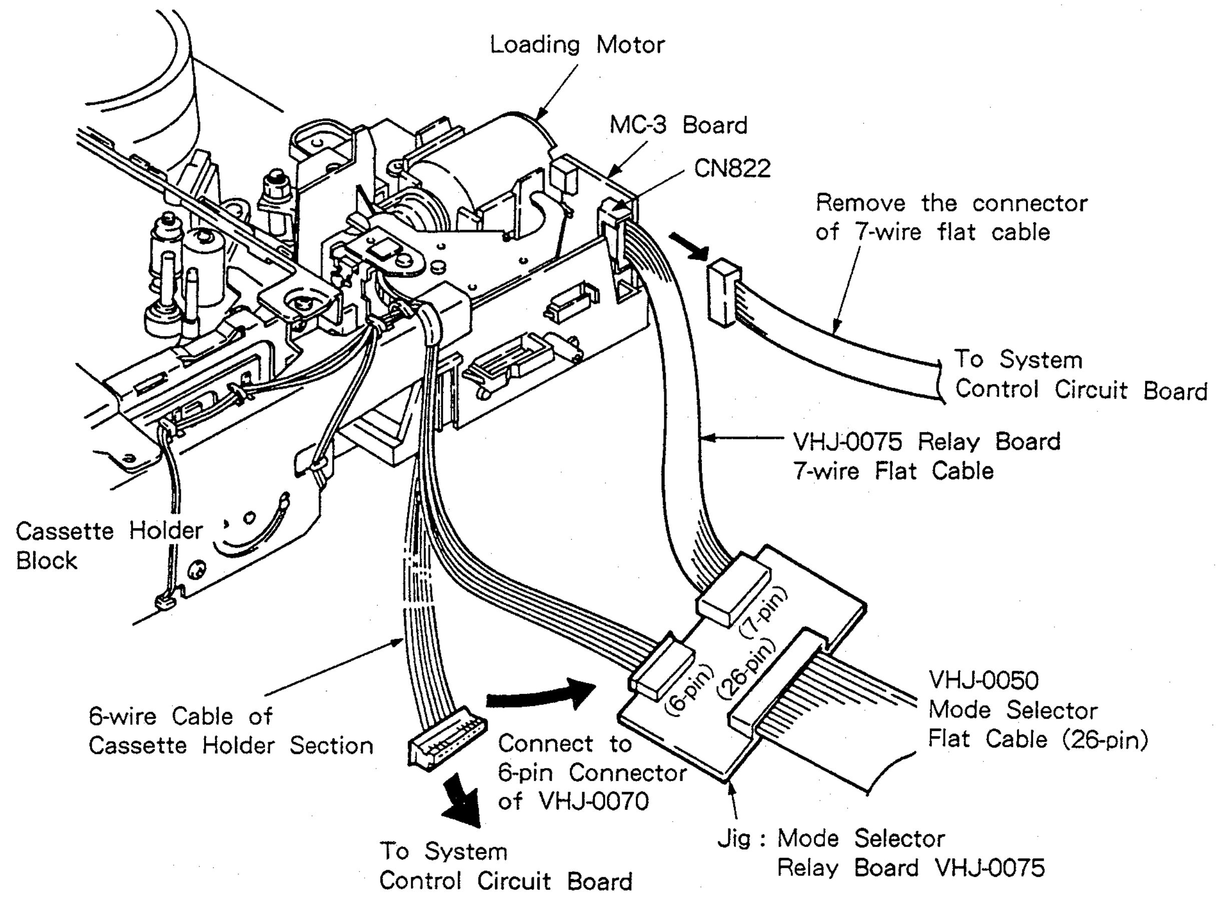

Loading Motor
MC-3 Board
CN822
Remove the connector of 7-wire flat cable
To System Control Circuit Board
VHJ-0075 Relay Board 7-wire Flat Cable
Cassette Holder Block
(7-pin)
(6-pin)
(26-pin)
VHJ-0050 Mode Selector Flat Cable (26-pin)
6-wire Cable of Cassette Holder Section
Connect to 6-pin Connector of VHJ-0070
To System Control Circuit Board
Jig : Mode Selector Relay Board VHJ-0075

Fig. 4-2-2 Connection

4-2-3. Handling Method

1) Keep the right side (⇨) of the mode selector key pressed, and the mode will change in the following sequence : EJECT⇨INITIAL⇨BRAKE⇨STOP/REW/FWD⇨STILL⇨PLAY⇨IDLER⇨REV.
2) When changing the mode in the REV···⇨EJECT direction, press the left side (⇦) of the mode selector key until the desired mode is indicated.
3) In the mid position of each mode during a shift to other mode, the "BLANK" LED lights. But the "PLAY", "IDLER", "REV" LEDs light between the EJECT mode and the INITIAL mode. Be sure therefore to check the mechanism body to see just what state the mechanism is in.
   Incidentally, if the mode selector is not connected to the mechanism, the "BLANK" LED lights to indicate the power ON.
4) The SLOW position of POWER switch makes relatively slow motions in comparison with the NORMAL position.

Note 1 : The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2 : If the left side (⇦) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇨) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. In this condition, as there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇨) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition (Refer to A and B in Fig. 4-5-5 of section 4-5-2. Loading Motor).

When the front loading mechanism returns to the initial condition, operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode selector indicator lamps (mode is not properly indicated, however, during EJECT to INITIAL).

Sometimes, engagement of the front helical gear with the front worm gear is delayed, operation mode of the mechanism main body gets too much ahead and the front loading mechanism mode cannot be switched to the initial condition. In that case, press the left side (⇦) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3 : The mode selector indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

5. MECHANISM DISMANTLING AND REASSEMBLING

5-1. MECHANISM MAIN UNIT (See Fig. 5-1-1.)

1. Removal

1) Remove the connectors of the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible cable ① connecting the COMPL CYLINDER to the PRE-AMP UNIT ③ (See Fig. A).
3) Remove the two screws ②, then remove the PRE-AMP UNIT ③.
4) Remove the screw ④, then remove the PRE-AMP. BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the three screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.
   Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws. (See Fig. B)

Note : Shape of the PRE-AMP UNIT ③ and the PRE-AMP. BRACKET ⑤ differ depending on the model.

2. Remounting

1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP. BRACKET ⑤ with the two screws ④.
4) Mount the PRE-AMP UNIT ③ and the ground lug with the two screws ② (some models are not provided with a ground lug).
5) Insert the flexible cable ① into the connector of the PRE-AMP UNIT.
6) Connect the connectors of COMPL MC-3 and COMPL HEAD BRACKET.

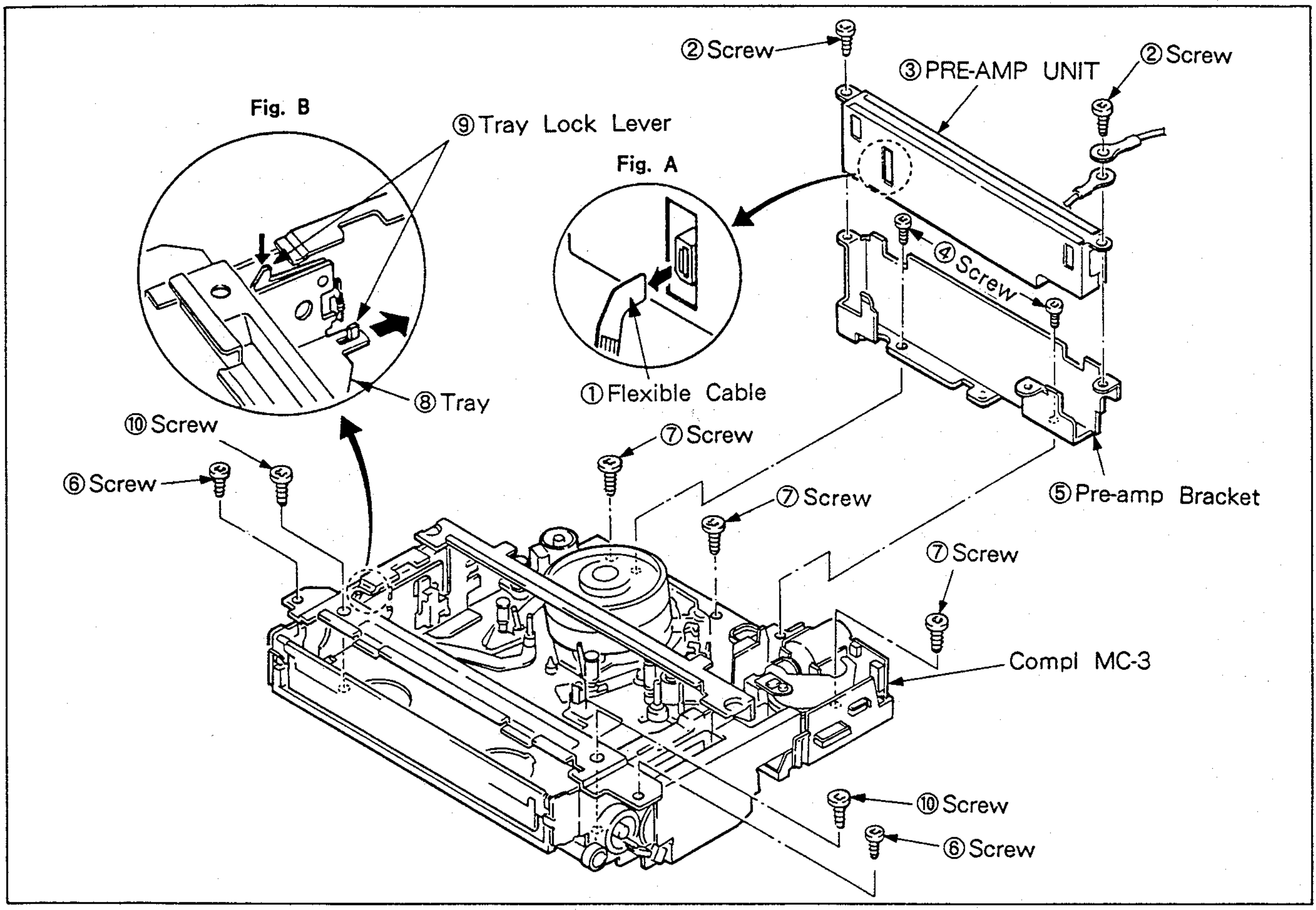

②Screw
③PRE-AMP UNIT
②Screw
Fig. B
⑨Tray Lock Lever
Fig. A
④Screw
⑧Tray
①Flexible Cable
⑩Screw
⑦Screw
⑥Screw
⑦Screw
⑤Pre-amp Bracket
⑦Screw
Compl MC-3
⑩Screw
⑥Screw

Fig. 5-1-1 Mecahnism Main Unit

5-2. CASSETTE HOLDER MECHANISM

5-2-1. COMPL Cassette Mechanism (See Fig. 5-2-1.)

1. Removal

1) Set the video main unit to the EJECT completed mode.
2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from CASSETTE HOLDER.
3) Remove the two screws ①.
4) Remove the two screws ②.
5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front (See Fig. B). When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from above, match the front loading gear hole ⑤ with the MOTOR HOLDER hole ⑥ as shown in Fig. A).
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
   Match positions of the FRONT LOADING GEAR △ mark ⑦ and the RACK EJECT mark ⑧. (See Fig. A.)
4) Fix to the mechanism chassis with the two screws ②.
5) Fix to the chassis with the screw ①.
6) Connect to the various connectors.

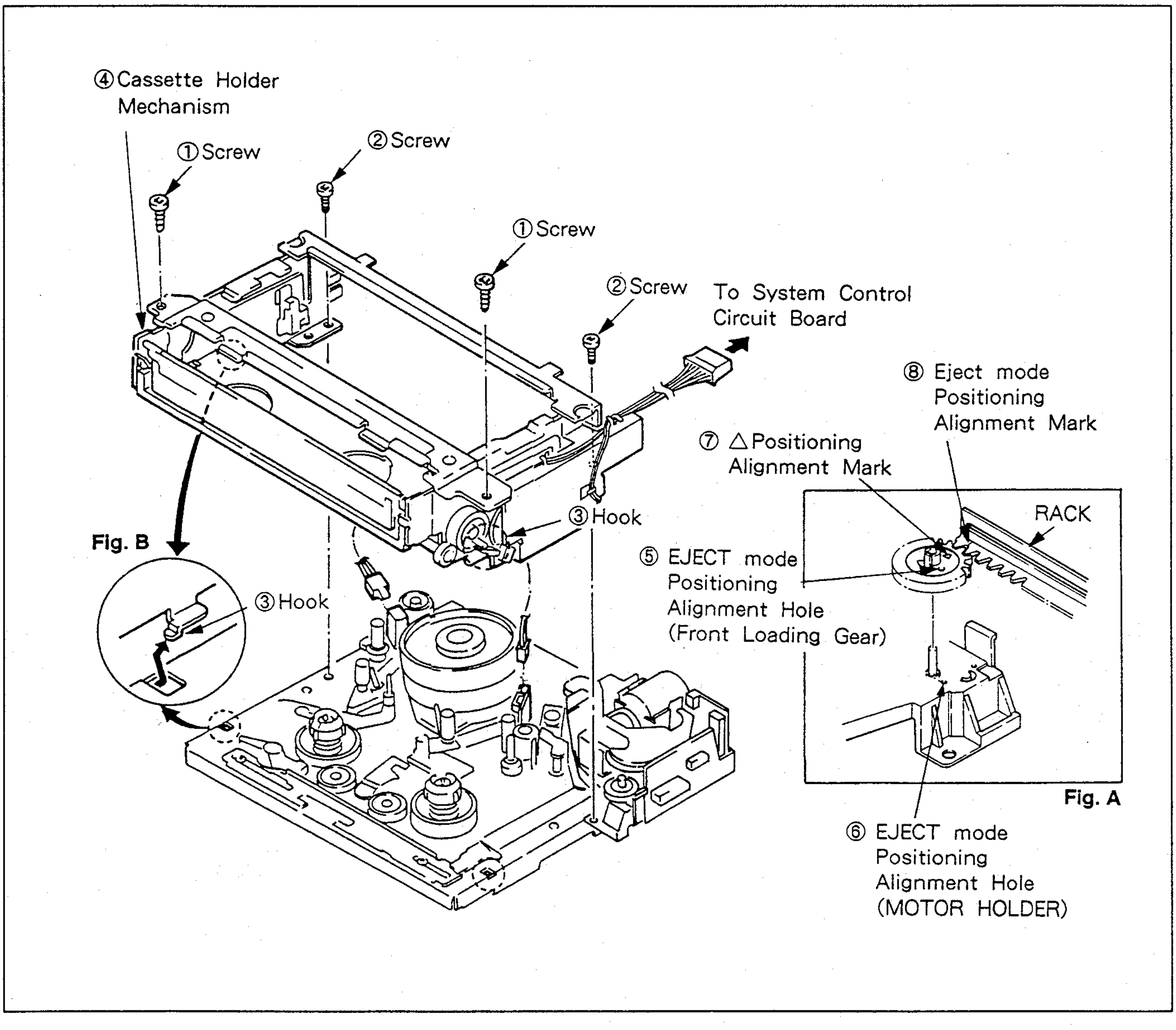

④Cassette Holder Mechanism
①Screw
②Screw
①Screw
②Screw
To System Control Circuit Board
⑧ Eject mode Positioning Alignment Mark
⑦ △Positioning Alignment Mark
RACK
③Hook
⑤ EJECT mode Positioning Alignment Hole (Front Loading Gear)
Fig. B
③Hook
Fig. A
⑥ EJECT mode Positioning Alignment Hole (MOTOR HOLDER)

Fig. 5-2-1 Compl Cassette Mechanism

5-2-2. Gear Bracket Ass'y (See Fig. 5-2-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the four screws ①, then remove the GEAR BRACKET ASS'Y ②.
3) Remove the E ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
3) Apply grease to the toothed part of the RACK ⑦.
4) Fit the RACK ⑦ onto the two pins ⑨. Match position of the hole ⑪ to the GEAR BRACKET hole ⑫.
5) Mount the PINION GEAR ⑥, PINION LEVER ASS'Y ⑤, and LOCK GEAR ④ in the shaft ⑧ in the order mentioned.
   Set the hole ⑬ of the PINION GEAR and the LOCK GEAR with the hole ⑪ of the RACK for proper positioning at that time.
6) Mount them in E-ring shaft.
7) Set the GEAR BRACKET ASS'Y ② to the dowel and mount it using four screws ①.
   Set the hole Ⓐ of the IDLER GEAR with the hole Ⓑ of the SIDE BOARD as shown in Fig. 5-2-3 at this time.
   Also set the hole ⑬ of the PINION GEAR and the LOCK GEAR with the hole ⑫ of the GEAR BRACKET by referring to Fig. 5-2-2. After mounting them, check to be sure that FL START SWITCH ⑭ is in the ON state shown in Fig. A.
8) Remount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

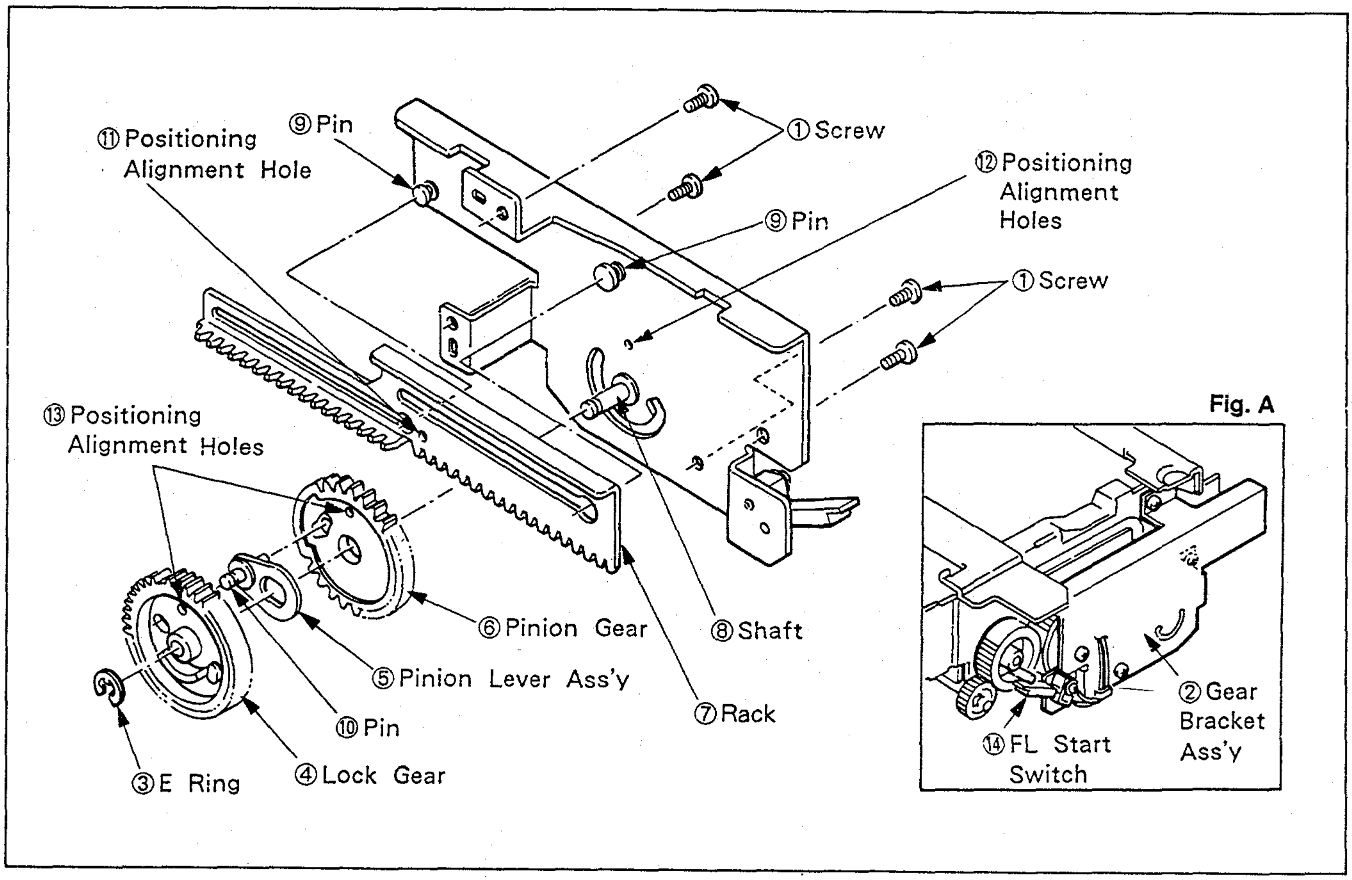

⑪ Positioning Alignment Hole
⑨ Pin
① Screw
⑫ Positioning Alignment Holes
⑨ Pin
① Screw
⑬ Positioning Alignment Holes
⑥ Pinion Gear
⑧ Shaft
⑤ Pinion Lever Ass'y
⑩ Pin
⑦ Rack
③ E Ring
④ Lock Gear
Fig. A
② Gear Bracket Ass'y
⑭ FL Start Switch

Fig. 5-2-2. Gear Bracket Ass'y

5-2-3. Cassette Drive Gear (Right) (See Fig. 5-2-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in 5-2-1. and 5-2-2., respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.
5) Open the hook ⑥ and remove the COUPLE GEAR R ⑦. Take care not to open the hook ⑥ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the IDLER GEAR R ⑧.

2. Remounting

1) Apply grease to gear parts that undergo friction.
2) Mount the IDLER GEAR R ⑧ onto the axle ⑨.
3) Mount the COUPLE GEAR R ⑦ onto the ROD ASS'Y axle ⑩. When doing so, match the couple gear position with the IDLER GEAR R ⑧ as shown in Fig. A.
4) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Match position to the IDLER GEAR R ⑧ as shown in Fig. A.
5) Mount the E ring ④ onto the axle ⑫.
6) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, match position to the IDLER GEAR R ⑧ as shown in Fig. A.
7) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR R ③ and the LEVER GEAR ASS'Y R.
8) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, match position to the MAIN GEAR as shown in Fig. A.
9) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM ASS'Y as instructed in 5-2-2. and 5-2-1., respectively.

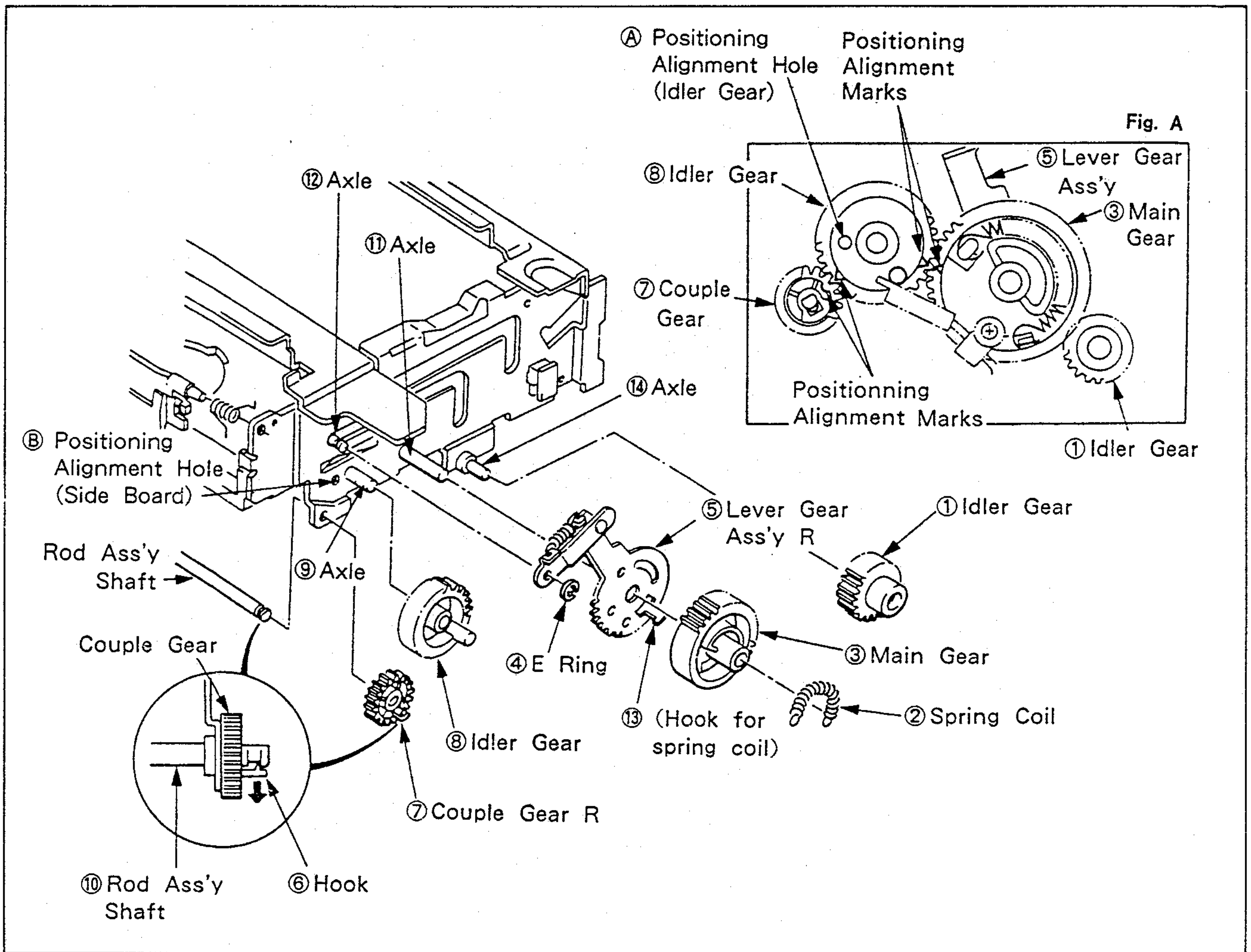

Ⓐ Positioning Alignment Hole (Idler Gear)
Positioning Alignment Marks
Fig. A
⑤Lever Gear Ass'y
③Main Gear
⑧Idler Gear
⑦Couple Gear
Positionning Alignment Marks
①Idler Gear
⑫Axle
⑪Axle
⑭Axle
Ⓑ Positioning Alignment Hole (Side Board)
Rod Ass'y Shaft
⑨Axle
Couple Gear
⑤Lever Gear Ass'y R
①Idler Gear
④E Ring
③Main Gear
⑬ (Hook for spring coil)
②Spring Coil
⑧Idler Gear
⑦Couple Gear R
⑩Rod Ass'y Shaft
⑥Hook

Fig. 5-2-3. Cassette Drive Gears (Right Side)

5-2-4. Cassette Drive Gear (Left) (See Fig. 5-2-4)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COUPLE GEAR R as instructed in 5-2-3.
3) Remove the ROD ASS'Y ①.
4) Remove the E ring ②.
5) Remove the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y ④.
7) Remove the IDLER GEAR L ⑥ and the DOOR OPEN LEVER ⑦.

2. Remounting

1) Apply grease to the axles ⑧, ⑨ and ⑩.
2) Apply grease to the IDLER GEAR L ⑥.
3) Mount the DOOR OPEN LEVER ⑦ onto the axle ⑧. Do it so that the end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.
4) Mount the IDLER GEAR L ⑥ onto the axle ⑧.
5) Pass the ROD ASS'Y ① through the hole ⑫. Match position of the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
6) Mount the COUPLE GEAR R as instructed in 5-2-3.
7) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
8) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Match position to the IDLER GEAR L ⑥ as shown in Fig. B.
9) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in 5-2-1.

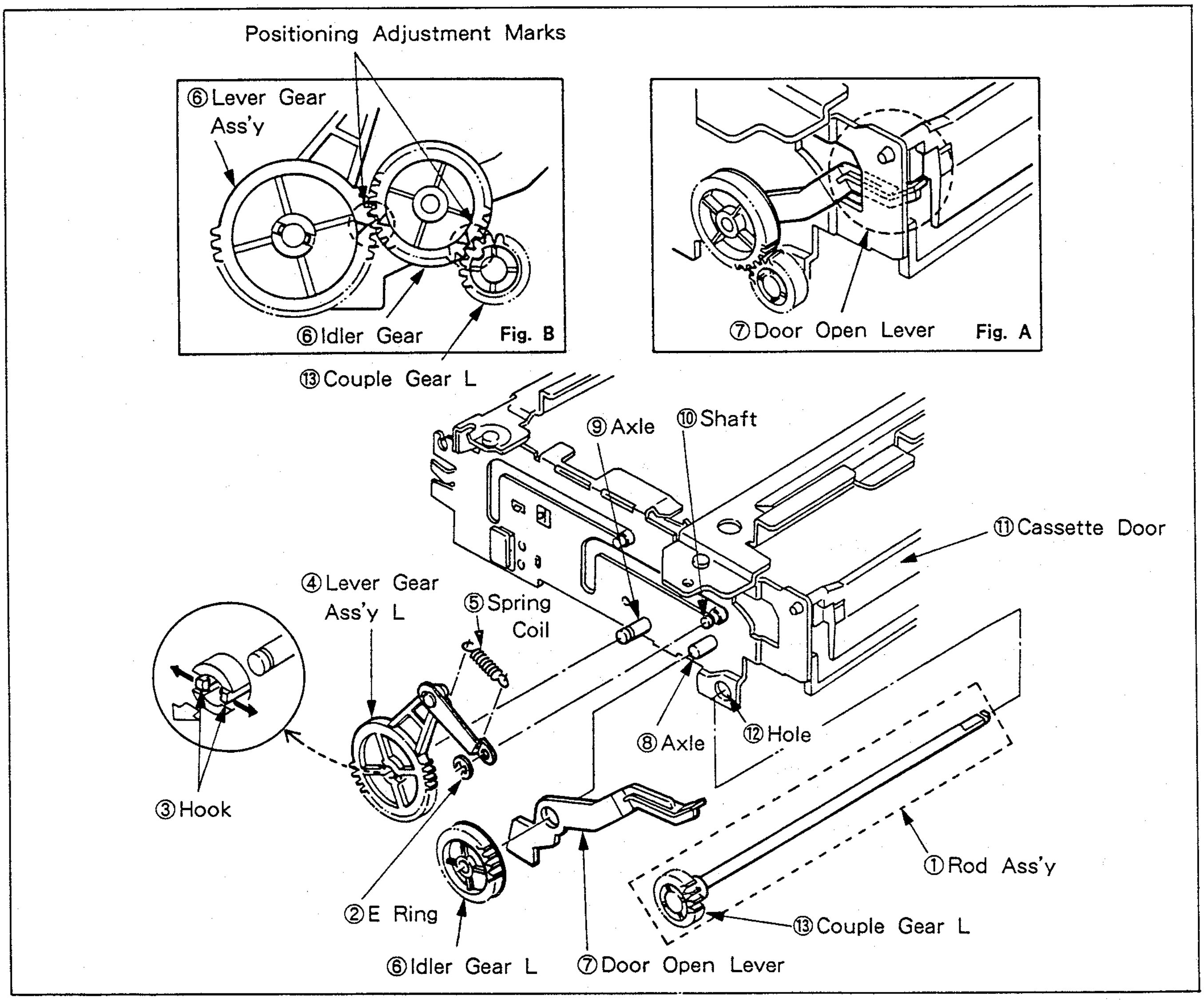

Positioning Adjustment Marks
⑥Lever Gear Ass'y
⑥Idler Gear
Fig. B
⑬Couple Gear L
⑦Door Open Lever
Fig. A
⑨Axle
⑩Shaft
⑪Cassette Door
④Lever Gear Ass'y L
⑤Spring Coil
⑧Axle
⑫Hole
③Hook
①Rod Ass'y
②E Ring
⑬Couple Gear L
⑥Idler Gear L
⑦Door Open Lever

Fig. 5-2-4. Cassette Drive Gears (Left Side)

5-2-5. FL Start Switch (See Fig. 5-2-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the screw ①.
3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting

1) Solder the lead wire to the FL START SWITCH ② terminal.
2) Align the FL START SWITCH ② protuberance to the hole ⑤, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of IDLER GEAR in the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

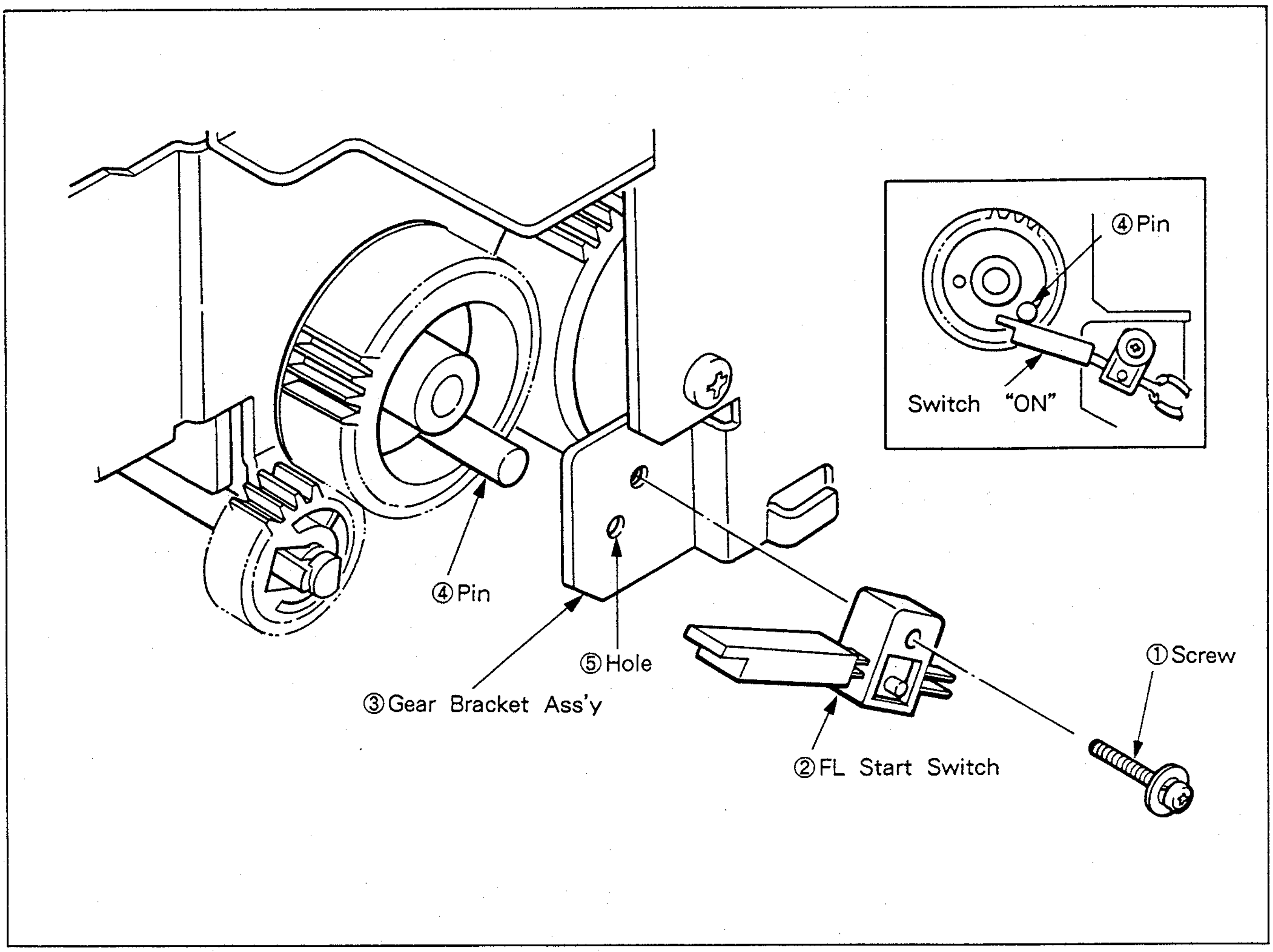

④Pin
Switch "ON"
④Pin
⑤Hole
③Gear Bracket Ass'y
①Screw
②FL Start Switch

Fig. 5-2-5. FL Start Switch

5-2-6. T-Top Sensor, T-End Sensor (See Fig. 5-2-6.)

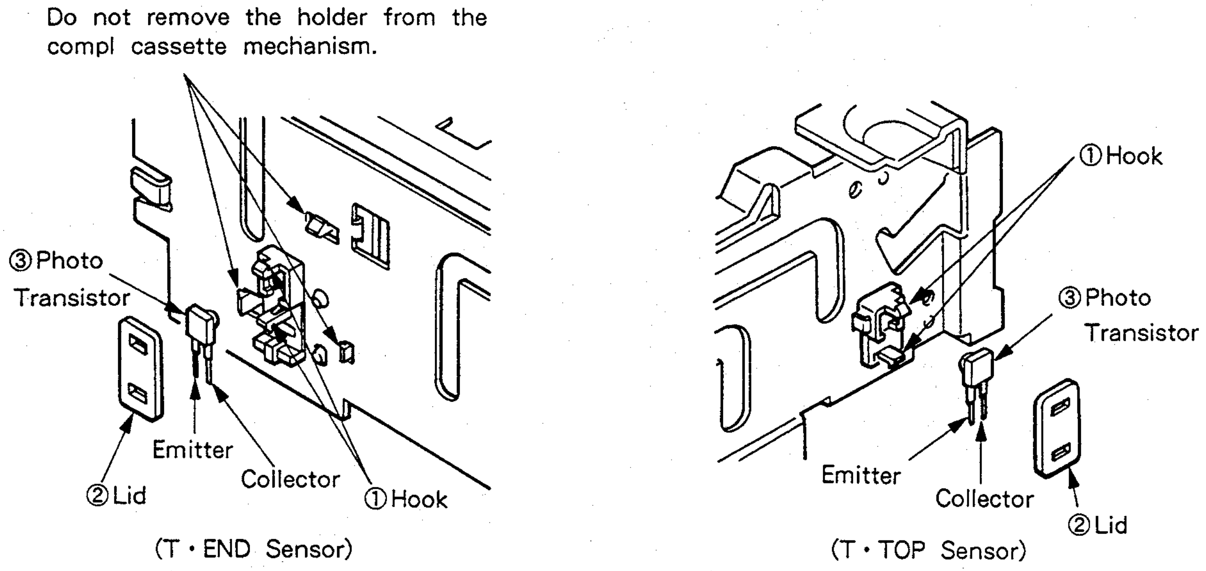
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in 5-2-2.
3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much, otherwise it may be deformed or broken.
4) Remove the phototransistors ③, then remove the lead wire.

Note : Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so do never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting

1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR phototransistor ③.
   Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR phototransistor.
2) Mount the phototransistors ③ onto their respective holders.
3) Mount the LID ② and fix it with the hook ①.
4) Mount the GEAR BRACKET ASS'Y as instructed in 5-2-2.
5) Mount the COMPL CASSETTE MECHANISM as insturcted in 5-2-1.


Do not remove the holder from the compl cassette mechanism.
③Photo Transistor
Emitter
Collector
②Lid
①Hook
①Hook
③Photo Transistor
Emitter
Collector
②Lid

(T • END Sensor)

(T • TOP Sensor)

Fig. A

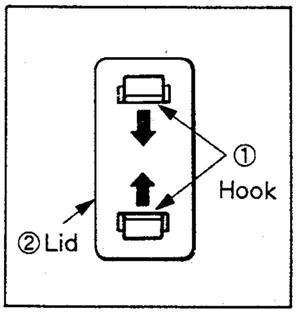


Fig. 5-2-6. T TOP Sensor & T END Sensor

5-3. COMPL HOLDER MOTOR (LOADING MOTOR BLOCK)

5-3-1. COMPL Motor Bracket

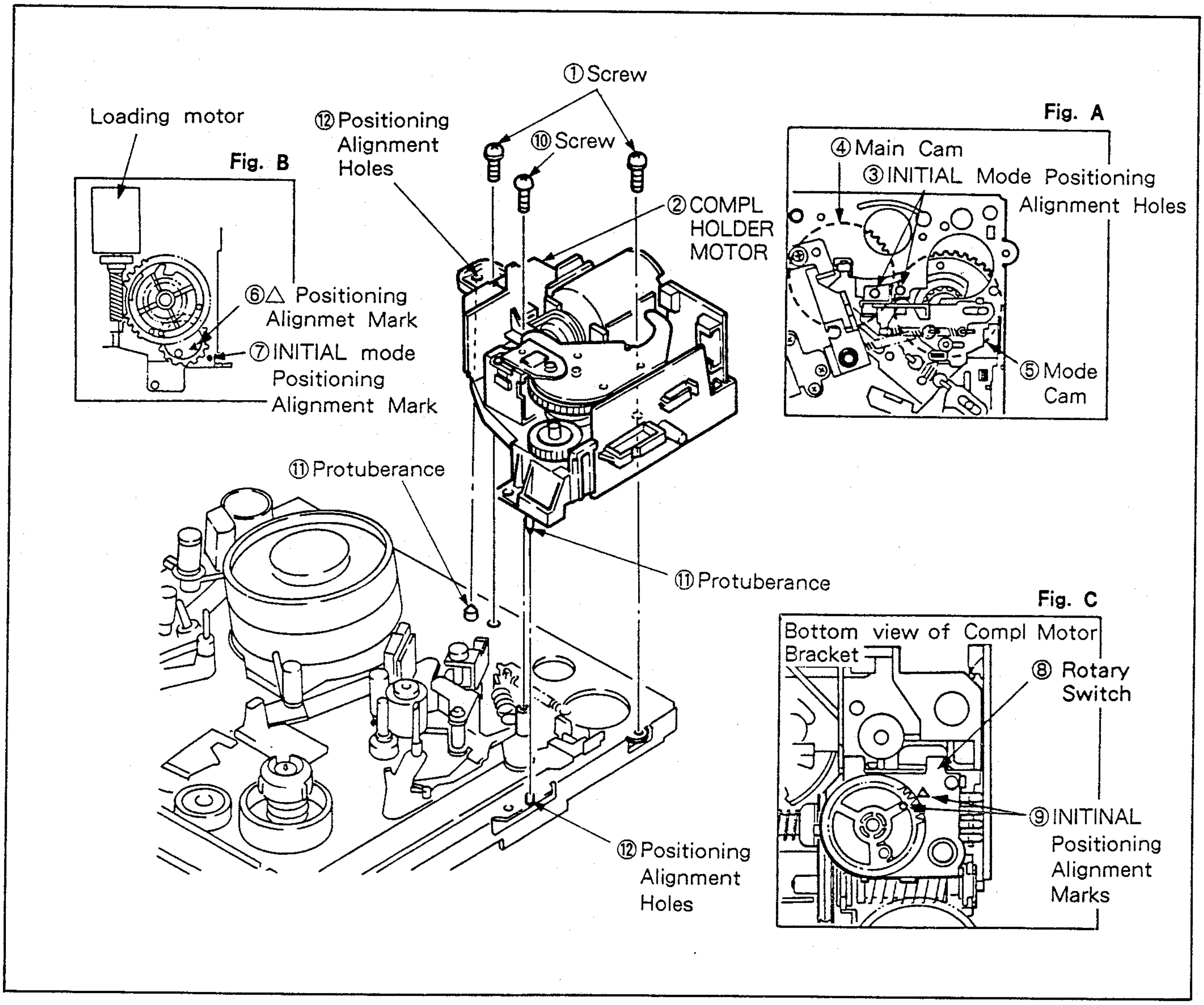
1. Removal

1) Remove the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 5-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
3) Remove the two screws ① and the other one ⑩, then remove the COMPL HOLDER MOTOR ② (see Fig. 5-3-1.).

2. Remounting

1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis positioning holes ③ just from above and align the MAIN CAM ④ and MODE CAM ⑤ positioning holes as shown in Fig. A.
2) Set the COMPL HOLDER MOTOR ② to the INITIAIL mode with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR △ mark ⑥ is aligned with the MOTOR HOLDER INITIAL mode position mark ⑦ (see Fig. B.).
3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode position mark ⑨ (see Fig. C.).
4) Align the COMPL HOLDER MOTOR main unit ② with the protuberance ⑪, then mount it with the two screws ① and the other one ⑩.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
6) Mount the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 5-1.

Note : Normal mechanism operation cannot be achieved if initial positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.



① Screw
Loading motor
⑫ Positioning Alignment Holes
⑩ Screw
Fig. B
② COMPL HOLDER MOTOR
⑥△ Positioning Alignmet Mark
⑦ INITIAL mode Positioning Alignment Mark
Fig. A
④ Main Cam
③ INITIAL Mode Positioning Alignment Holes
⑤ Mode Cam
⑪ Protuberance
⑪ Protuberance
Fig. C
Bottom view of Compl Motor Bracket
⑧ Rotary Switch
⑨ INITINAL Positioning Alignment Marks
⑫ Positioning Alignment Holes

Fig. 5-3-1 Compl Holder Motor

5-3-2. Loading Motor (Refer to Fig. 5-3-2.)

1. Removal

LOADING MOTOR can be replaced after LOADING MOTOR BLOCK unit has been removed by referring to 5-3-1. The 1990 version of the mechanism allows LOADING MOTOR itself to be replaced without removing CASSETTE HOLDER BLOCK and LOADING MOTOR BLOCK. The following describes this procedure.

1) Use MODE SELECTOR (VHJ-0050) to set the mechanism to the initial mode.
2) Remove the connector for DEW SENSOR connected to the MC-3 board ①.
3) Remove three screws ② and remove HOLDER BRACKET ④ with FRONT WORM ASS'Y ③ still attached.
4) Remove DAMPER ⑥ attached to the pulley of LOADING MOTOR ⑤.
5) Remove FRONT HELICAL GEAR ⑦ and WASHER ⑧.
6) Remove soldered LEAD WIRE from the terminal of LOADING MOTOR ⑤.
7) Remove LOADING BELT ⑨.
8) Remove LOADING MOTOR ⑤ by lifting up from the back terminal side.

2. Remounting

Before attaching LOADING MOTOR ⑤ to MOTOR BRACKET ASS'Y ⑩, confirm DAMPER ⑪ and DAMPER ⑫ shown in Fig. 5-3-5. are in the proper position on MOTOR BRACKET ASS'Y ⑩.

1) LOADING MOTOR ⑤ puts REAR SIDE BOSS ㉓ in the slit ㉔ of MOTOR HOLDER ⑩.
   Further, mount the tap hole ⑬ at two points of the front pulley side so that the it is secured to the PROTUBERANCE ⑭ of the MOTOR HOLDER at two points.
2) Solder the lead wire from the MC-3 board to LOADING MOTOR ⑤ terminal. (Solder the red lead wire to the positive terminal side.)
3) Hang LOADING BELT ⑨ on the pulley.
4) After hanging BELT ⑨ on the pulley, confirm that the mechanism unit is in the initial mode. The initial mode is indicated by Fig. A of Fig. 5-3-2., and is the position in which INITIAL POSITIONING ALIGNMENT HOLEs of MAIN CAM ⑮ and MODE CAM ⑯ are lined up with THROUGH HOLE ⑰ of MOTOR HOLDER. If the initial mode is not selected, adjust with MODE SELECTOR (VHJ-0050).
5) As shown in Fig. B, confirm the positions of the △ POSITIONING ALIGNMENT MARK on FRONT LOAD GEAR ⑱ and INITIAL MARK ⑲ position of MOTOR HOLDER and the position relationship of CASSETTE HOLDER RACK ⑳.
6) Apply a light coat of grease to the entire sides of AXLE ㉑ and FRONT HELICAL GEAR ⑦.
7) Attach FRONT HELICAL GEAR ⑦ and WASHER ⑧ to AXLE ㉑. As shown in Fig. C, FRONT HELICAL GEAR ⑦ is attached so that the indent on the side is inside PIN ㉒ of FRONT LEVER ASS'Y.
8) Attach DAMPER ⑥ to LOADING MOTOR ⑤ pulley.
9) HOLDER BRACKET ④ is attached by engaging FRONT WORM ASS'Y ③ with LOADING MOTOR ⑤ pulley, and held in place with three screws ②.
10) Attach the connector of DEW SENSOR ㉕ to the MC-3 board ① and return the mechanism to the eject completion using MODE SELECTOR.

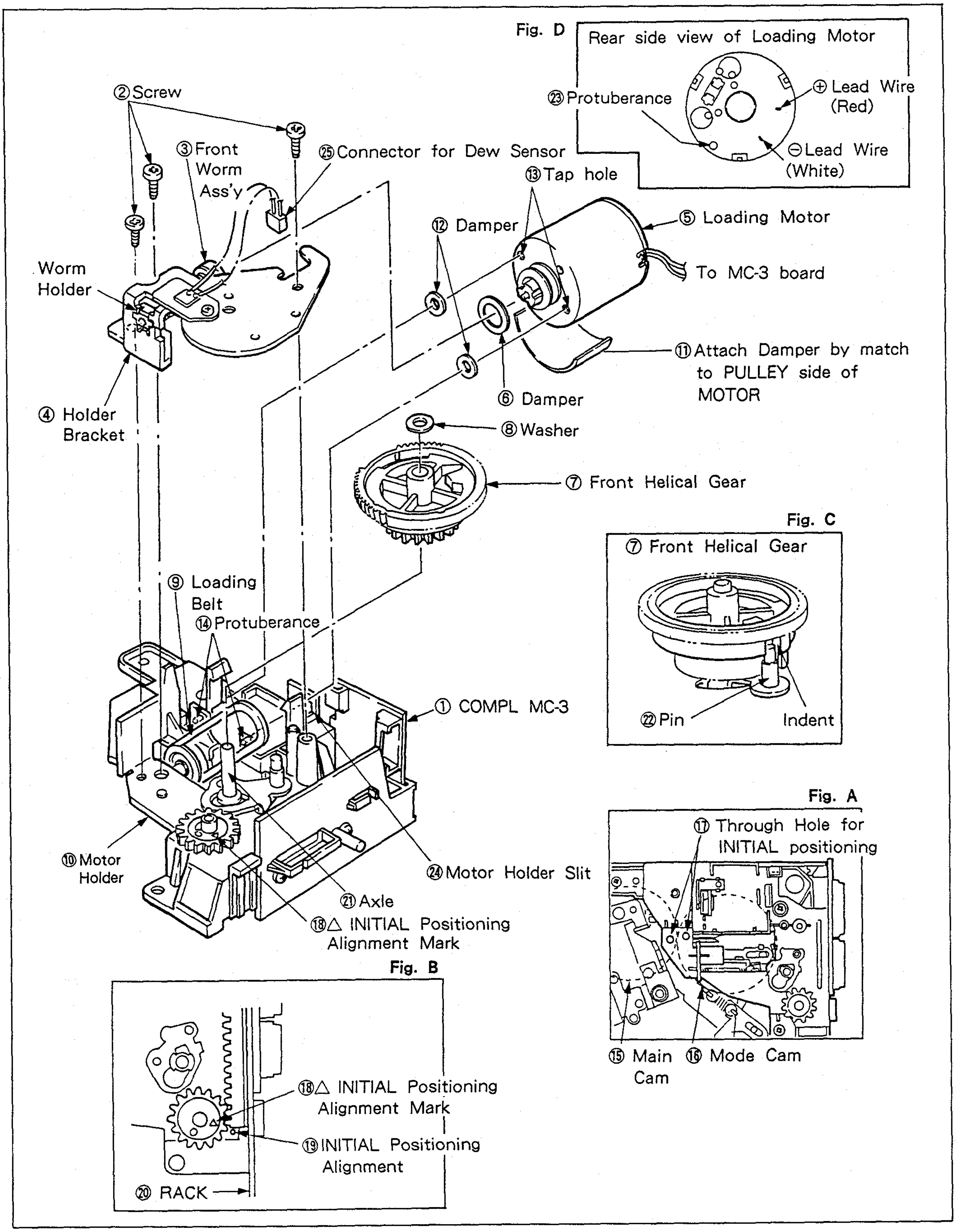


Fig. D
Rear side view of Loading Motor
㉓Protuberance
⊕ Lead Wire (Red)
⊖Lead Wire (White)
②Screw
③Front Worm Ass'y
㉕Connector for Dew Sensor
⑬Tap hole
⑫ Damper
⑤ Loading Motor
To MC-3 board
Worm Holder
⑪Attach Damper by match to PULLEY side of MOTOR
④ Holder Bracket
⑥ Damper
⑧Washer
⑦ Front Helical Gear
Fig. C
⑦ Front Helical Gear
㉒Pin
Indent
⑨ Loading Belt
⑭Protuberance
① COMPL MC-3
Fig. A
⑰ Through Hole for INITIAL positioning
⑩Motor Holder
㉔Motor Holder Slit
㉑Axle
⑱△ INITIAL Positioning Alignment Mark
⑮ Main Cam
⑯ Mode Cam
Fig. B
⑱△ INITIAL Positioning Alignment Mark
⑲INITIAL Positioning Alignment
⑳ RACK

Fig. 5-3-2. Loading Motor

5-4. TAPE LOADING MECHANISM

5-4-1. Main Parts of the Tape Loading Mechanism (See Fig. 5-4-1.)

1. Removal

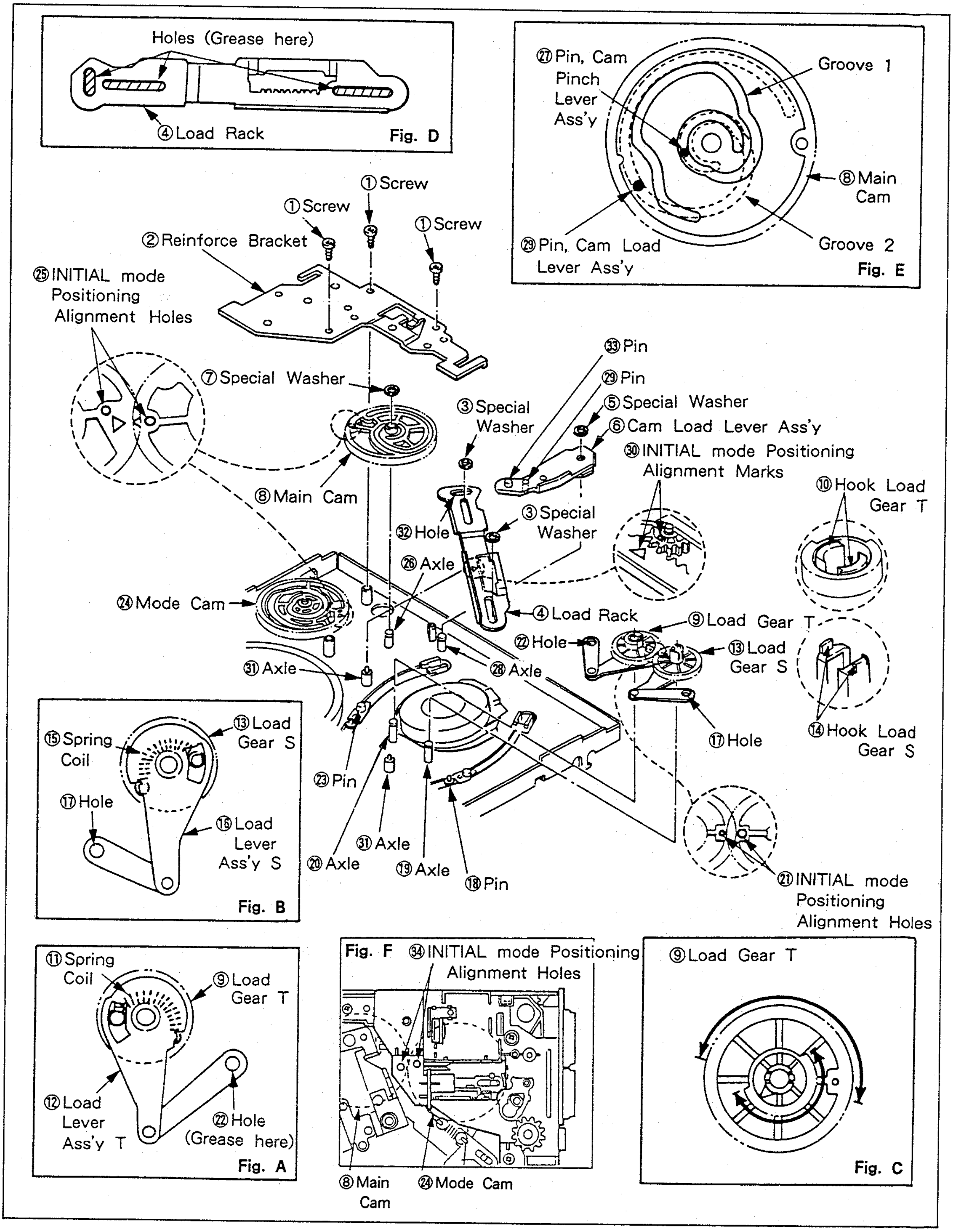
1) Remove connectors from the DRUM MOTOR board (SV-5).
2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
3) Remove the two special washers ③, then remove the LOAD RACK ④.
4) Remove the special washer ⑤, then remove the CAM LOAD LEVER ASS'Y ⑥.
5) Remove the stop washer ⑦, then remove the MAIN CAM ⑧.
6) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
7) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL S ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note : Take care not to open the LOAD GEAR hooks too much, otherwise they may be deformed or broken. If they are, replace them.

2. Remounting

1) Apply grease to the inner surface of the LOAD LEVER ASS'Y S ⑯ hole ⑰, as shown in Fig. B.
2) Apply grease to the inner surface of the LOAD LEVER ASS'Y T ⑫ hole ㉒ and to the section of the LOAD GEAR T ⑨ indicated with an arrow in Fig. C.
3) Apply grease to GROOVEs 1 and 2 of the MAIN CAM ⑧, and to the outer side of the teeth.
4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
5) Apply grease to the outer surface of axles ⑲ ⑳㉖ and ㉘.
6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑱ into the LOAD LEVER ASS'Y S hole ⑰.
7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ⑳. When doing so, set the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position ㉑. Insert the ROLLER BASE T pin ㉓ into the hole ㉒ of the LOAD LEVER ASS'Y T ⑫.
8) Mount the MAIN CAM ⑧ on the axle ㉖. At that time, make sure that the positioning hole ㉕ of the MAIN CAM ⑧ and the MODE CAM ㉔ matches the initial positioning hole ㉞ of the MECHANISM CHASSIS. Also check to be sure that the Pin ㉗ of the CAM PINCH LEVER ASSEMBLY is put in the groove ① of the MAIN CAM as shown in Fig. E.
9) Mount the special washer ⑦ to the axle ㉖.
10) Mount the CAM LOAD LEVER ASS'Y ⑥ onto the axle ㉘. Insert the pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
11) Mount the special washer ⑤ onto the axle ㉘.
12) Set the LOAD RACK ④ to the INITIAL mode position ㉚ with the LOAD GEAR T ⑨, and mount onto the two axles ㉛. Insert the CAM LOAD LEVER ASS'Y pin ㉝ into the hole ㉜.
13) Mount the two special washers ③ onto the two axles ㉛.
14) Mount the REINFORCE BRACKET ② with the three screws ①.
15) Insert the connector into the DRUM MOTOR board (SV-5).
16) Confirm that loading and unloading are performed smoothly.

Note : Be sure to perform INITIAL mode positioning of cams and gears precisely.


Holes (Grease here)
④Load Rack
Fig. D
㉗Pin, Cam Pinch Lever Ass'y
Groove 1
⑧Main Cam
㉙Pin, Cam Load Lever Ass'y
Groove 2
Fig. E
①Screw
①Screw
①Screw
②Reinforce Bracket
㉕INITIAL mode Positioning Alignment Holes
⑦Special Washer
⑧Main Cam
③Special Washer
㉝Pin
㉙Pin
⑤Special Washer
⑥Cam Load Lever Ass'y
㉚INITIAL mode Positioning Alignment Marks
⑩Hook Load Gear T
㉜Hole
③Special Washer
㉖Axle
㉔Mode Cam
④Load Rack
㉒Hole
⑨Load Gear T
⑬Load Gear S
㉛Axle
㉘Axle
⑰Hole
⑭Hook Load Gear S
⑮Spring Coil
⑬Load Gear S
⑰Hole
⑯Load Lever Ass'y S
Fig. B
㉓Pin
㉛Axle
⑳Axle
⑲Axle
⑱Pin
㉑INITIAL mode Positioning Alignment Holes
⑪Spring Coil
⑨Load Gear T
⑫Load Lever Ass'y T
㉒Hole (Grease here)
Fig. A
Fig. F
㉞INITIAL mode Positioning Alignment Holes
⑧Main Cam
㉔Mode Cam
⑨Load Gear T
Fig. C

5-4-1. Loading Mechanism Main Parts

5-4-2. Mode Cam (See Fig. 5-4-2.)

1. Removal

1) Set the INITIAL mode with the mode selector (VHJ-0050).
2) Remove the REINFORCE BRACKET as instructed in 5-4-1.
3) Remove the two stop washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
4) Remove the MODE CAM ③.

2. Remounting

1) Referring to 5-4-1., confirm that the MAIN CAM is in the INITIAL mode position.
2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (refer to 5-4-1. for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode position mark ⑤ as shown in Fig. A.
4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in the GROOVE 3 as shown in Fig. B.
5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that the pin ⑧ gets into the GROOVE 4 of the MODE CAM as shown in Fig. B, and the point ⑨ of the bent-up part into the ACT PLATE SLIDE ASS'Y hole ⑩.
6) Mount the two special washers ① onto the axles ⑥ and ⑦.
7) Mount the REINFORCE BRACKET as instructed in 5-4-1.

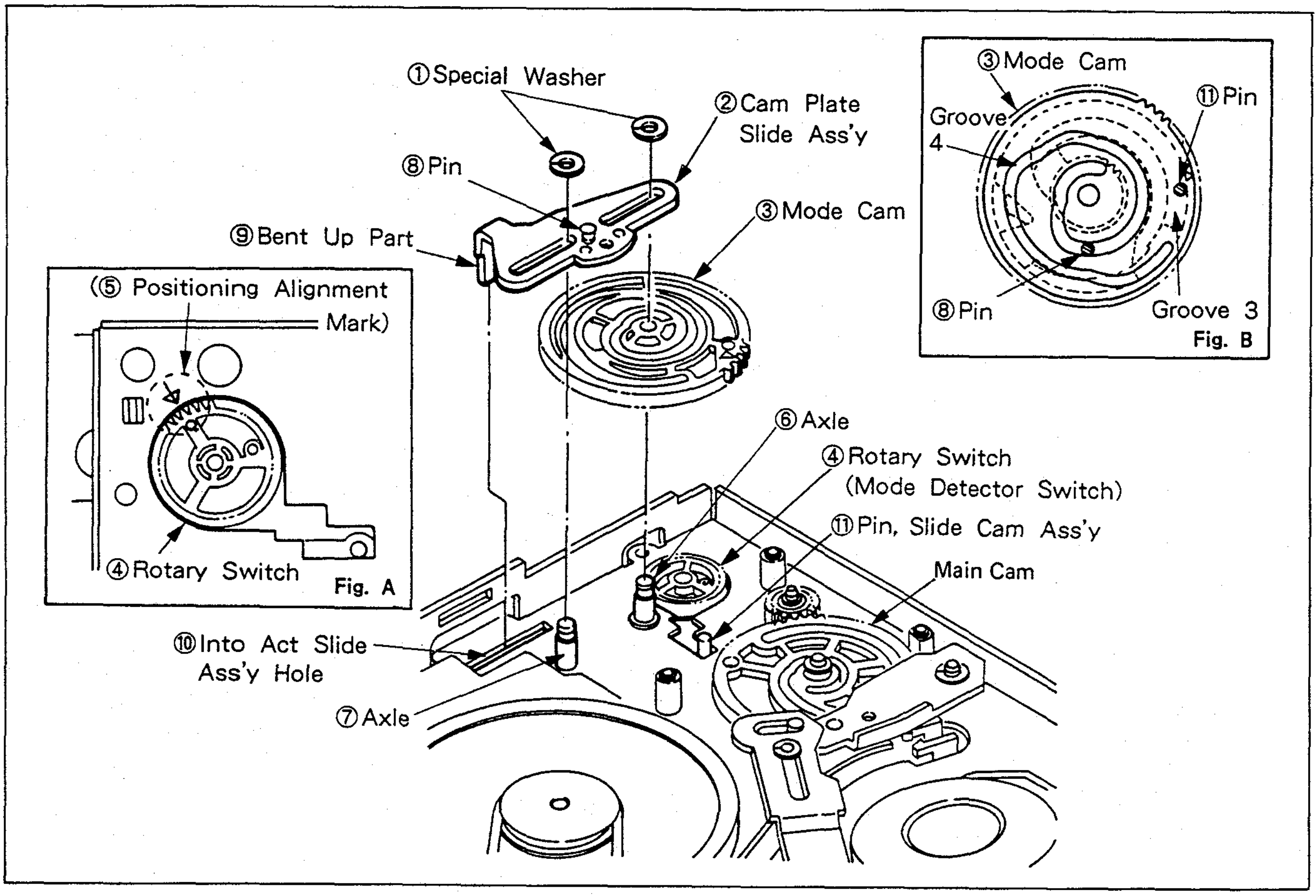

①Special Washer
②Cam Plate Slide Ass'y
⑧Pin
③Mode Cam
⑨Bent Up Part
(⑤ Positioning Alignment Mark)
④Rotary Switch
Fig. A
⑥Axle
④Rotary Switch (Mode Detector Switch)
⑪Pin, Slide Cam Ass'y
Main Cam
⑩Into Act Slide Ass'y Hole
⑦Axle
③Mode Cam
⑪Pin
Groove 4
⑧Pin
Groove 3
Fig. B

Fig. 5-4-2. Mode Cam .

5-5. COMPL HEAD BRACKET (ACE HEAD) (See Fig. 5-5-1.)

1. **Removal**

1) Remove the COMPL HEAD BRACKET special mounting nut ②.
2) Remove the SLEEVE ③, the COMPL HEAD BRACKET ① and the ACE HEAD SPRING COIL ④, in that order.

Note : Take care not to scratch or soil the ACE head surface.

2. **Remounting**

1) Apply grease to the axle ⑥ as shown in Fig. A.
2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦ (See Fig. A).
3) Mount the ACE HEAD SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the ACE HEAD SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦ (See Fig. A).
4) Mount the SPECIAL NUT ② onto the axle ⑥ through the SLEEVE ③.
5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
6) Perform ACE head adjustment as instructed in 6-4.

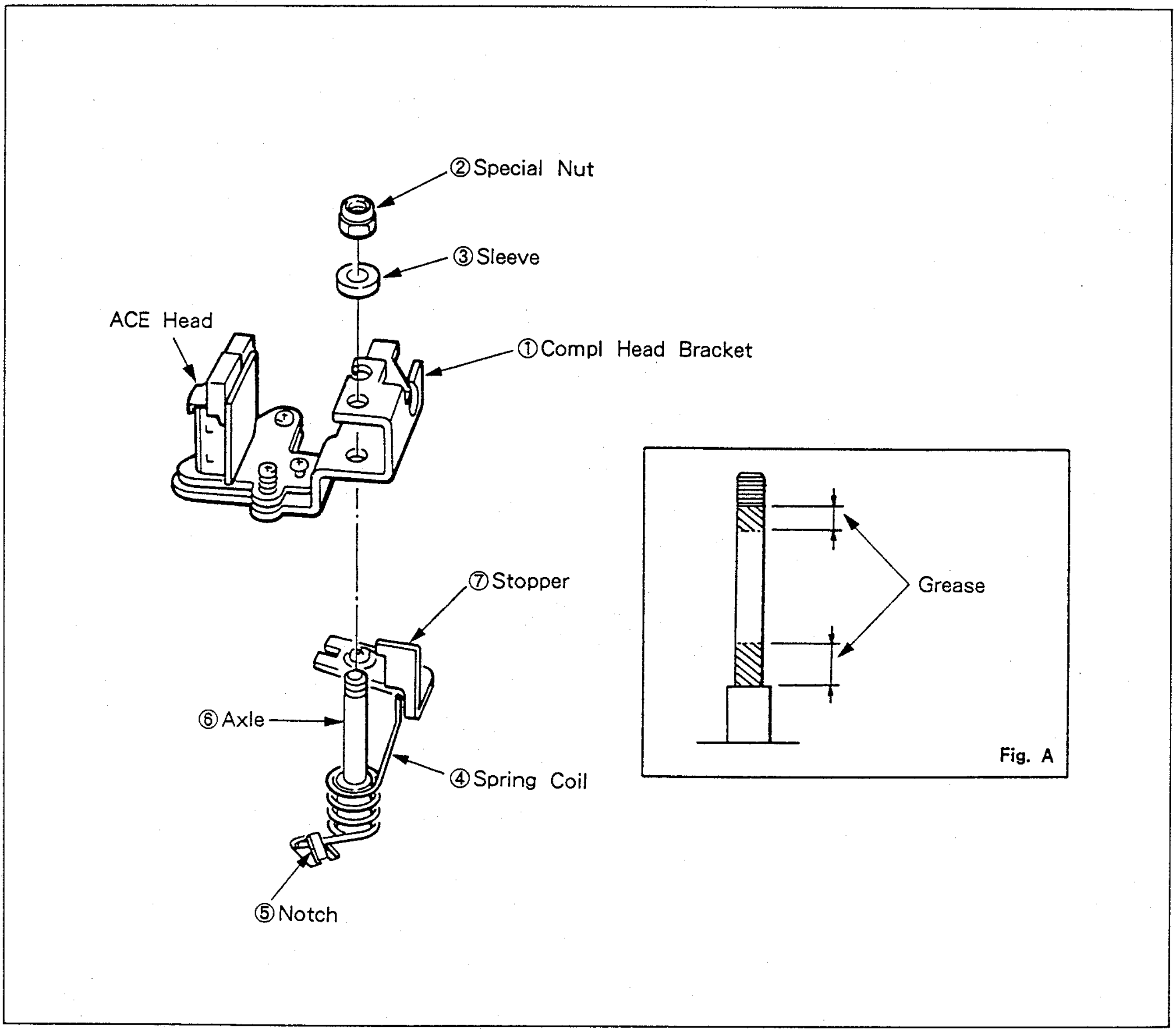

②Special Nut
③Sleeve
ACE Head
①Compl Head Bracket
⑦Stopper
⑥Axle
④Spring Coil
⑤Notch
Grease
Fig. A

Fig. 5-5-1. Compl Head Bracket (ACE Head)

5-6. PINCH ROLLER PRESSURE MECHANISM (See Fig. 5-6-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COMPL HEAD BRACKET as instructed in 5-5.
3) Remove the PINCH SPRING COIL ①.
4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
5) Remove the REV GUIDE LEVER SPRING COIL ④.
6) Remove the REV GUIDE LEVER ASS'Y ⑥ from the hook ⑤ of the plastic molding bearing on the bottom side. Use a jig VHJ-0073 shown in Fig. 5-6-2 to widen the hook ⑤ of the plastic molding bearing. By so doing, the above removal of the REV GUIDE LEVER ASS'Y ⑥ can be made more easily. Care should be taken to avoid pushing the jig VHJ-0073 too much. Pushing it too hard may damage the hook in an extreme case.
7) Remove the LINK LOCK SPRING COIL ⑦.
8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

Note : If damaged the claw ⑤ of the plastic bearing, reference should be made to Section 3. "Method of Repairing the Bearing Section of REV GUIDE LEVER ASSEMBLY".

2. Remounting

1) Apply grease to pins ⑫/⑬ and axles ⑯/⑱.
2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
3) Set the INITIAL mode with the mode selector (VHJ-0050).
4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
5) Insert the pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and mount onto the axle ⑯ while inserting the pin ⑰ of the ACT PINCH SLIDE ASS'Y into the hole ⑮.
6) Mount the special washer ⑧ onto the axle ⑯.
7) Hook the LINK LOCK SPRING COIL ⑦ to the PINCH CAM LEVER ASS'Y ⑨.
8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then fix it with the hook ⑤ at the bottom.
9) Hook the REV GUIDE LEVER SPRING COIL ④.
10) Mount the PINCH LEVER ASS'Y ③ to the axle ⑱.
11) Mount the special washer ② to the axle ⑱.
12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
13) Mount the COMPL HEAD BRACKET as instructed in 5-5.
14) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
15) Perform ACE head adjustment as instructed in 6-4.

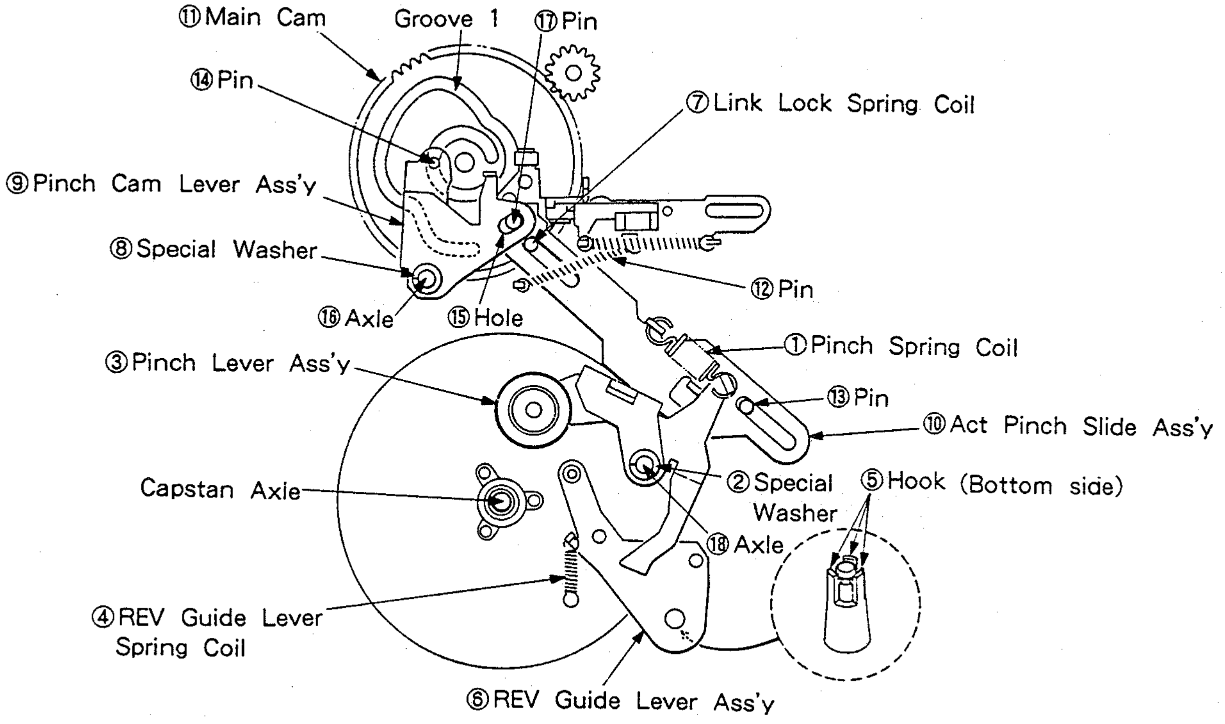
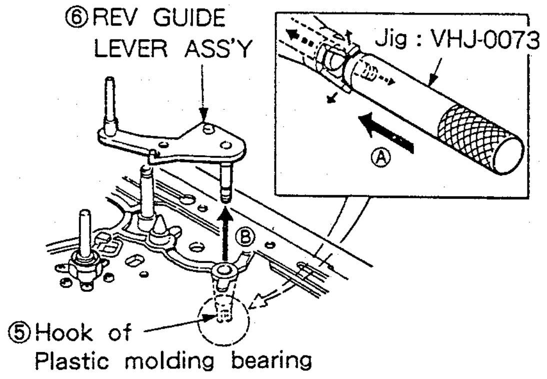

⑪Main Cam
Groove 1
⑰Pin
⑭Pin
⑦Link Lock Spring Coil
⑨Pinch Cam Lever Ass'y
⑧Special Washer
⑫Pin
⑯Axle
⑮Hole
③Pinch Lever Ass'y
①Pinch Spring Coil
⑬Pin
⑩Act Pinch Slide Ass'y
Capstan Axle
②Special Washer
⑤Hook (Bottom side)
⑱Axle
④REV Guide Lever Spring Coil
⑥REV Guide Lever Ass'y

Fig. 5-6-1. Pinch Roller Pressing Mechanism


⑥REV GUIDE
LEVER ASS'Y
Jig : VHJ-0073
Ⓐ
Ⓑ
⑤Hook of
Plastic molding bearing

Remove REV GUIDE LEVER ASS'Y in the direction of arrow Ⓑ, pushing VHJ-0073 slightly in the direction of arrow Ⓐ.
Be careful not to damage the hook by pushing too much.

Fig. 5-6-2 Method of Using the Jig VHJ-0073

3. Method of Repairing the Bearing Section of REV GUIDE LEVER ASSEMBLY

If the hook of the plastic molding bearing is damaged in the process of removing the REV GUIDE LEVER ASS'Y, proceed with the repair as follows :

1) Scrape the broken hook of the bearing section with a cutter knife and flatten it.
2) Insert the REV GUIDE LEVER ASS'Y in the bearing and fit a stopper washer in. The special washer to be used must be Part No. 411 109 1605. This stop washer (Part No. 411 109 1605) is the same as that used on SUPPLY REEL ASS'Y or TAKE-UP REEL ASS'Y.
   Remove the REV GUIDE LEVER ASSEMBLY toward an arrow B while pushing the jig VHJ-0073 lightly in the direction of an arrow.

Pushing the jig VHJ-0073 too much may cause hook breakage. Therefore, care should be taken.

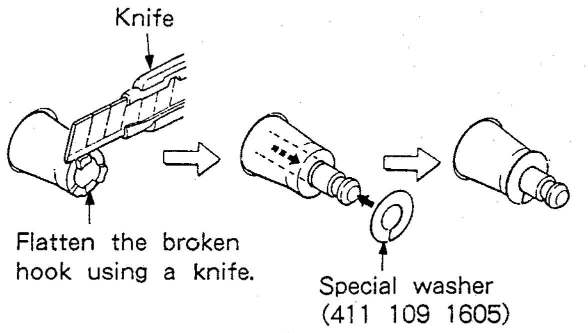

Knife
Flatten the broken
hook using a knife.
Special washer
(411 109 1605)

Fig. 5-6-3 Method of Repairing the Bearinig Section of the REV GUIDE LEVER ASSEMBLYE

5-7. BRAKE MECHANISM

5-7-1. Sub Take-up Brake Ass'y (See Fig. 5-7-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SPRING COIL ①.
3) While pushing the hook ② in the direction of arrow, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting

1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto the pin ④. Confirm that the hook ② is firmly hooked to the chassis.
2) Fit the SPRING COIL between hooks ⑤ and ⑥.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

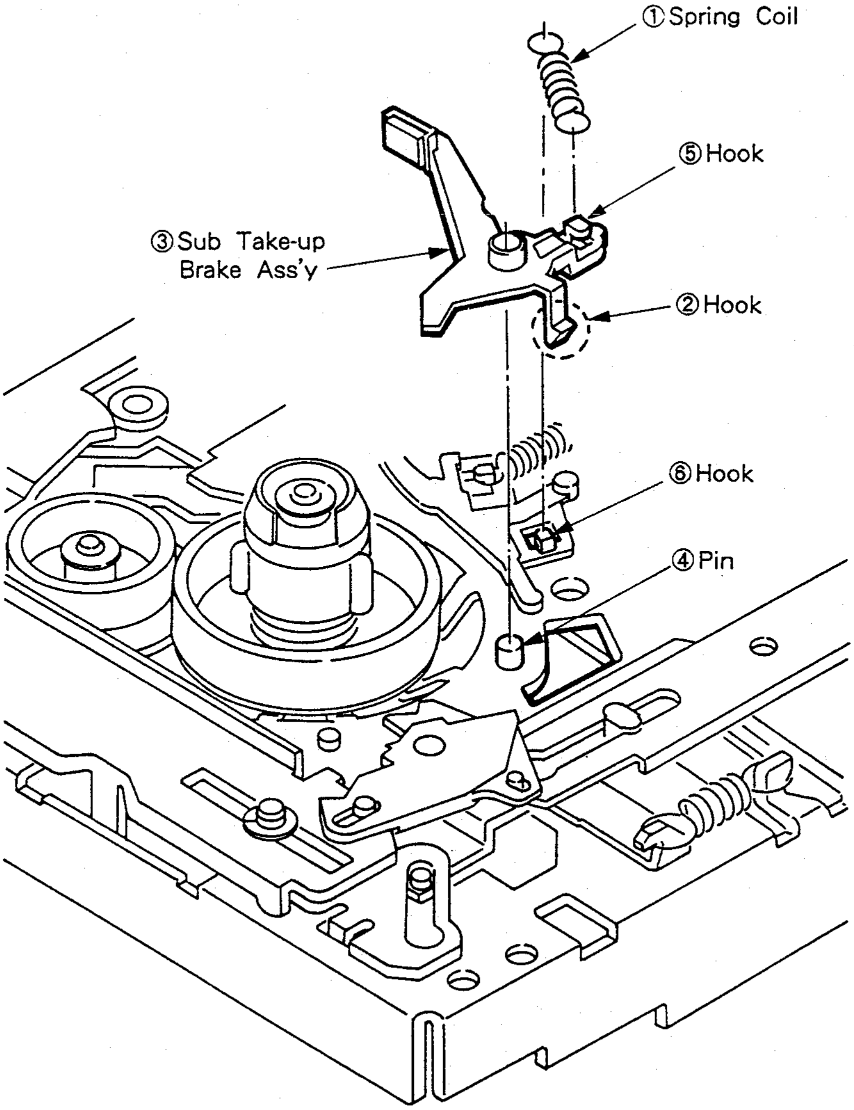

①Spring Coil
⑤Hook
③Sub Take-up Brake Ass'y
②Hook
⑥Hook
④Pin

Fig. 5-7-1. Sub Take-up Brake Ass'y

5-7-2. Supply Brake Ass'y and Take-up Brake Ass'y (See Fig. 5-7-2.)

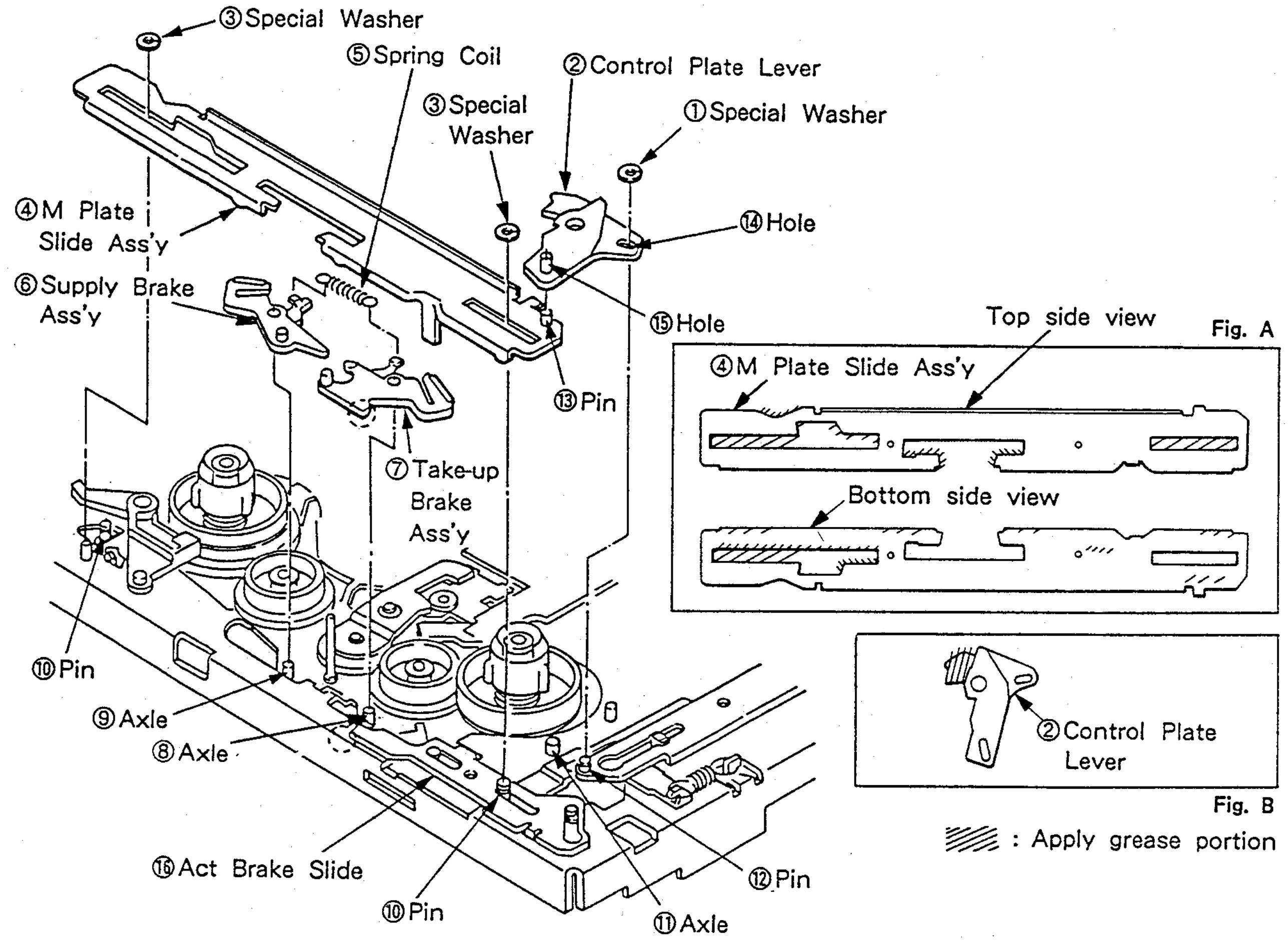
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SUB TAKE-UP BRAKE as instructed in 5-7-1.
3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
5) Remove the SPRING COIL ⑤.
6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note : Take care not to soil the brake shoes.

2. Remounting

1) Apply a thin layer of grease to axles ⑧ and ⑨.
2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
5) Mount the two special washers ③ onto the two pins ⑩.
6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert the ACT PLATE SLIDE ASS'Y pin ⑫ into the hole ⑭, and the M PLATE SLIDE ASS'Y pin ⑬ into the hole ⑮.
7) Mount the special washer ① onto the pin ⑫.
8) Mount the SUB TAKE-UP BRAKE as instructed in 5-7-1.
9) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.


③Special Washer
⑤Spring Coil
②Control Plate Lever
③Special Washer
①Special Washer
④M Plate Slide Ass'y
⑭Hole
⑥Supply Brake Ass'y
⑮Hole
⑬Pin
⑦Take-up Brake Ass'y
⑩Pin
⑨Axle
⑧Axle
⑯Act Brake Slide
⑩Pin
⑫Pin
⑪Axle
Top side view
Fig. A
④M Plate Slide Ass'y
Bottom side view
②Control Plate Lever
Fig. B

▨ : Apply grease portion

When assembling, the contact surfaces of Take-up Brake ⑦ and the Brake Slide ⑯ marked with ◌ should contact but not overlap each other.

Fig. 5-7-2. Supply Brake Ass'y & Take-up Brake Ass'y

5-7-3. Tension Lever Ass'y and Band Holder Ass'y (See Fig. 5-7-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the SPRING COIL ①.
3) Remove the screw ③ fixing the BAND HOLDER ASS'Y ②.
4) Push the SUB SUPPLY BRAKE ④ in the direction of the arrow A, setting the BAND HOLDER ASS'Y ② free.
5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much, otherwise it may be deformed or broken.
6) Remove the hook ⑦ of the BAND HOLDER ASS'Y.

2. Remounting

1) Mount the BAND HOLDER ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧.
2) Insert the TENSION LEVER ASS'Y axle ⑨ into the hole ⑩ and confirm that the hook ⑤ is hooked.
3) While pushing the SUB SUPPLY BRAKE ④ in the direction of arrow A, mount the BAND HOLDER ASS'Y ② with the screw ③.
4) Hook the SPRING COIL ① between the hooks ⑪ and ⑫.
5) Perform TENSION POLE position adjustment as instructed in 6-3.
6) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

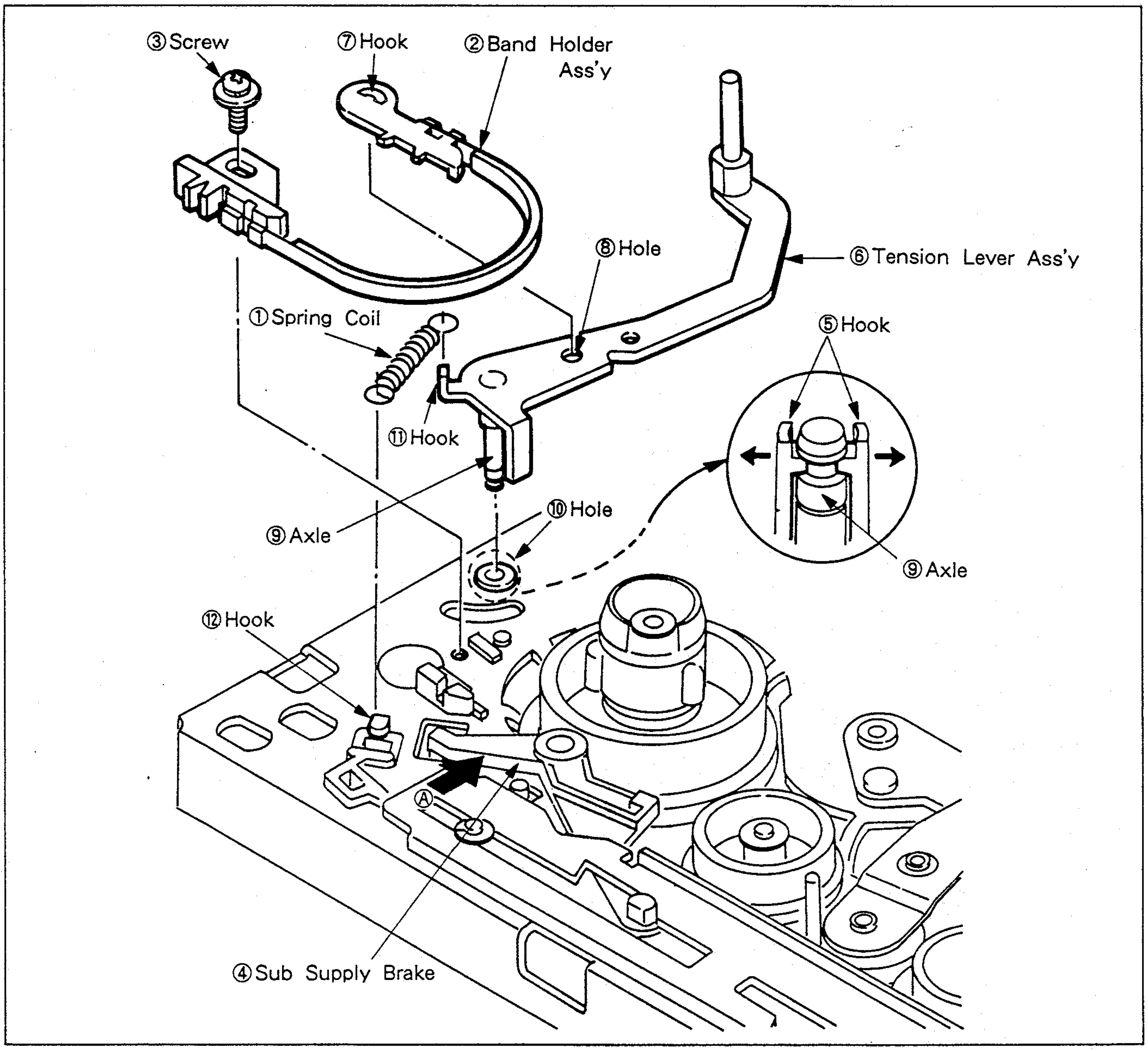

③Screw
⑦Hook
②Band Holder Ass'y
⑧Hole
⑥Tension Lever Ass'y
①Spring Coil
⑤Hook
⑪Hook
⑩Hole
⑨Axle
⑨Axle
⑫Hook
Ⓐ
④Sub Supply Brake

Fig. 5-7-3. Tension Lever Ass'y & Band Holder Ass'y

5-7-4. Capstan Brake Ass'y (See Fig. 5-7-4.)

1. Removal

1) Remove the SPRING COIL ①.
2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting

1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Fix the hook ⑥ side with adhesive (use an adhesive that allows later detaching).

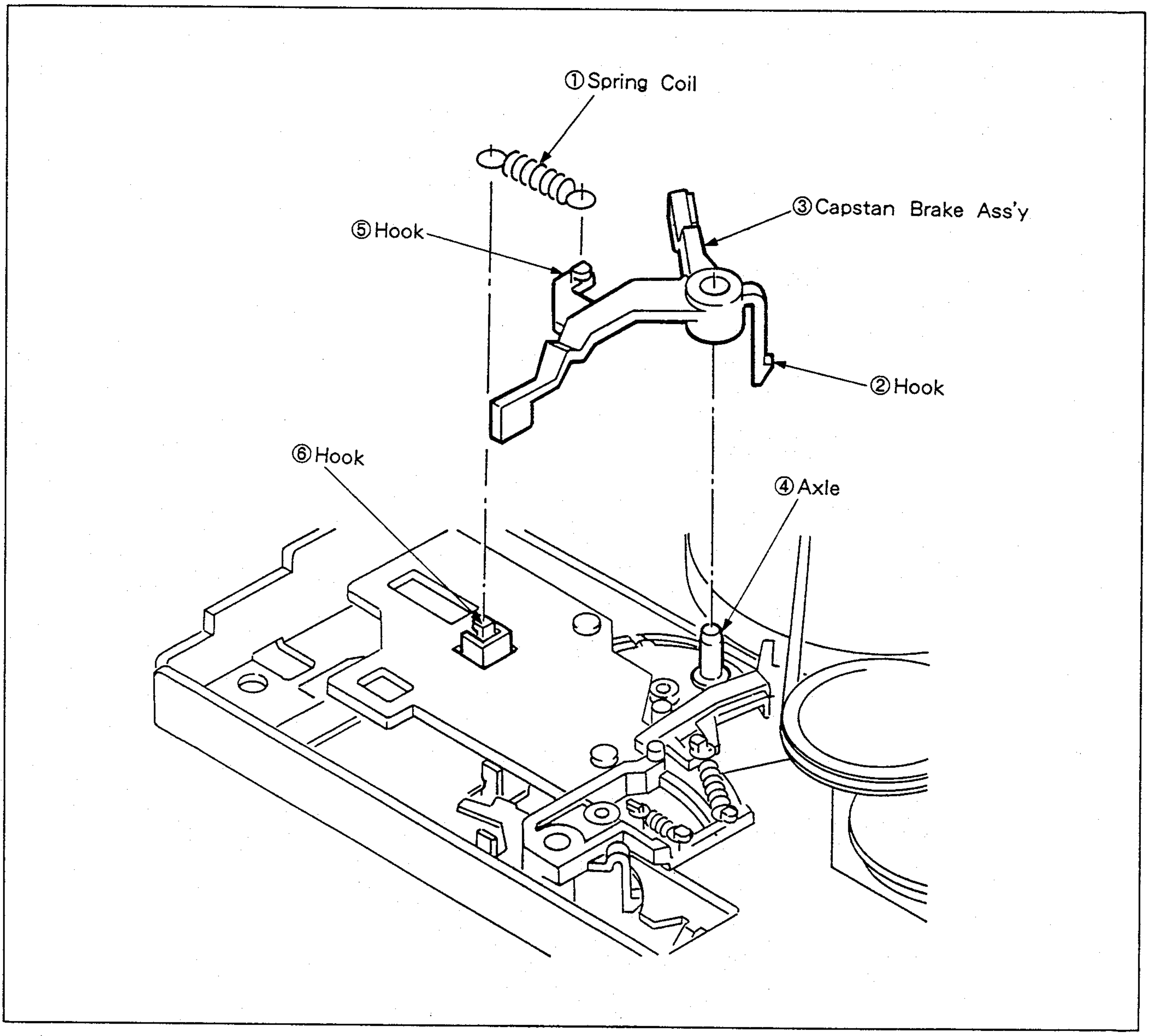

①Spring Coil
③Capstan Brake Ass'y
⑤Hook
②Hook
⑥Hook
④Axle

Fig. 5-7-4. Capstan Brake Ass'y

5-8. REEL TABLE DRIVE MECHANISM

5-8-1. Supply Reel Ass'y and Supply Reel Gear (See Fig. 5-8-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the BAND HOLDER ASS'Y as instructed in 5-7-3.
3) Set the PLAY mode with the mode selector (VHJ-0050).
4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
5) Remove the special washer ④.
6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by the arrow B, then mount the washer ⑦.
2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, mount the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
3) Mount the special washer ④ to the axle ⑧.
4) Apply 1 drop of oil to the part of the axle ⑨ indicated by the arrow C, then mount the washer ③.
5) Mount the SUPPLY REEL ASS'Y ② onto the axle ⑨.
6) Perform reel table height adjustment as instructed in 6-2-1.
7) Mount the special washer ① onto the axle ⑨.
8) Mount the BAND HOLDER ASS'Y as instructed in 5-7-3.
9) Perform tension pole position adjustment as instructed in 6-3.
10) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

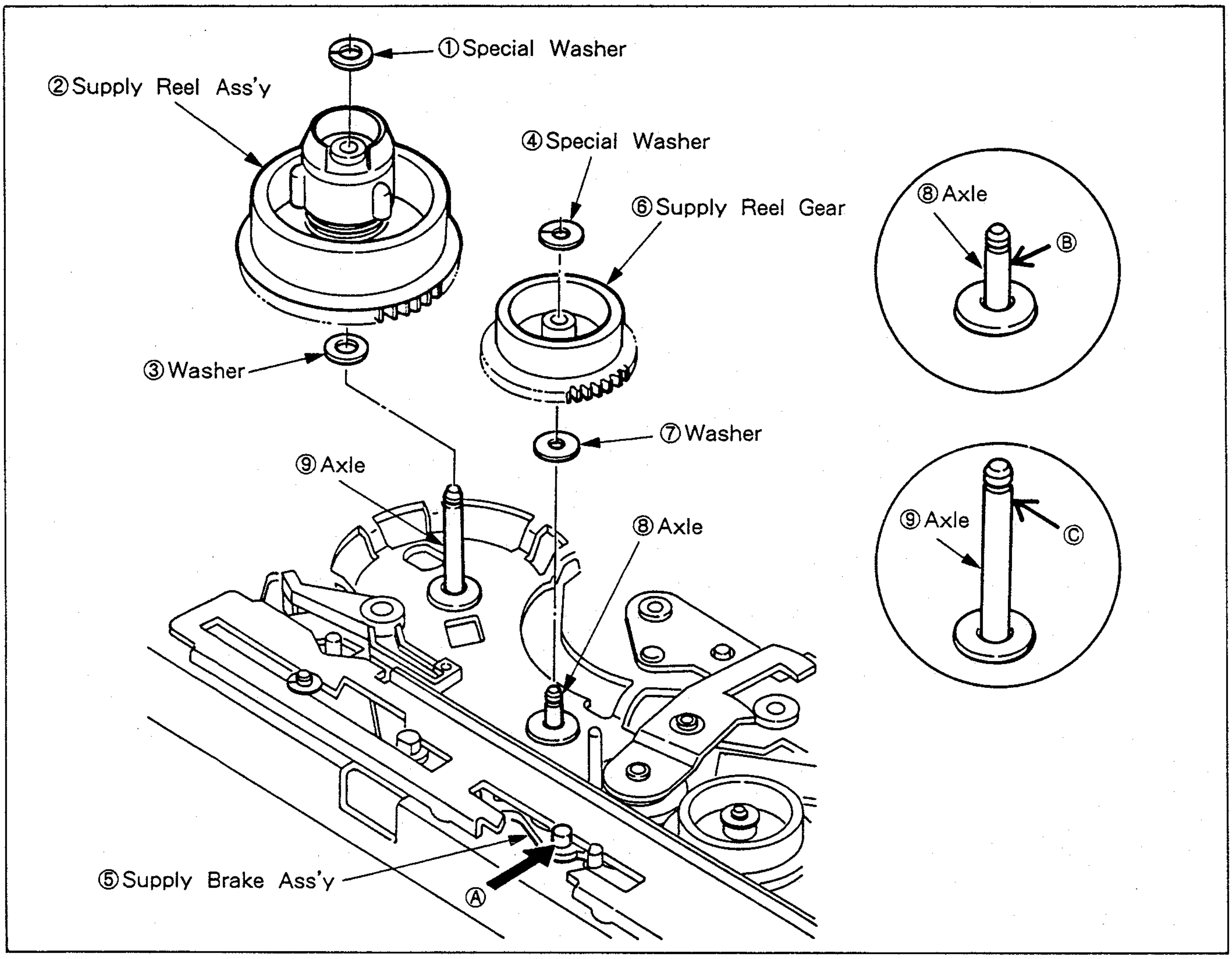


Fig. 5-8-1. Supply Reel Ass'y & Supply Reel Gear

5-8-2. Take-up Reel Ass'y (See Fig. 5-8-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the special washer ①.
3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply 1 drop of oil to the part of the axle ⑤ indicated by the arrow B, then mount the washer ④.
2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A, mount the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
3) Perform reel table height adjustment as instructed in 6-2.
4) Mount the special washer ① onto the axle ⑤.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

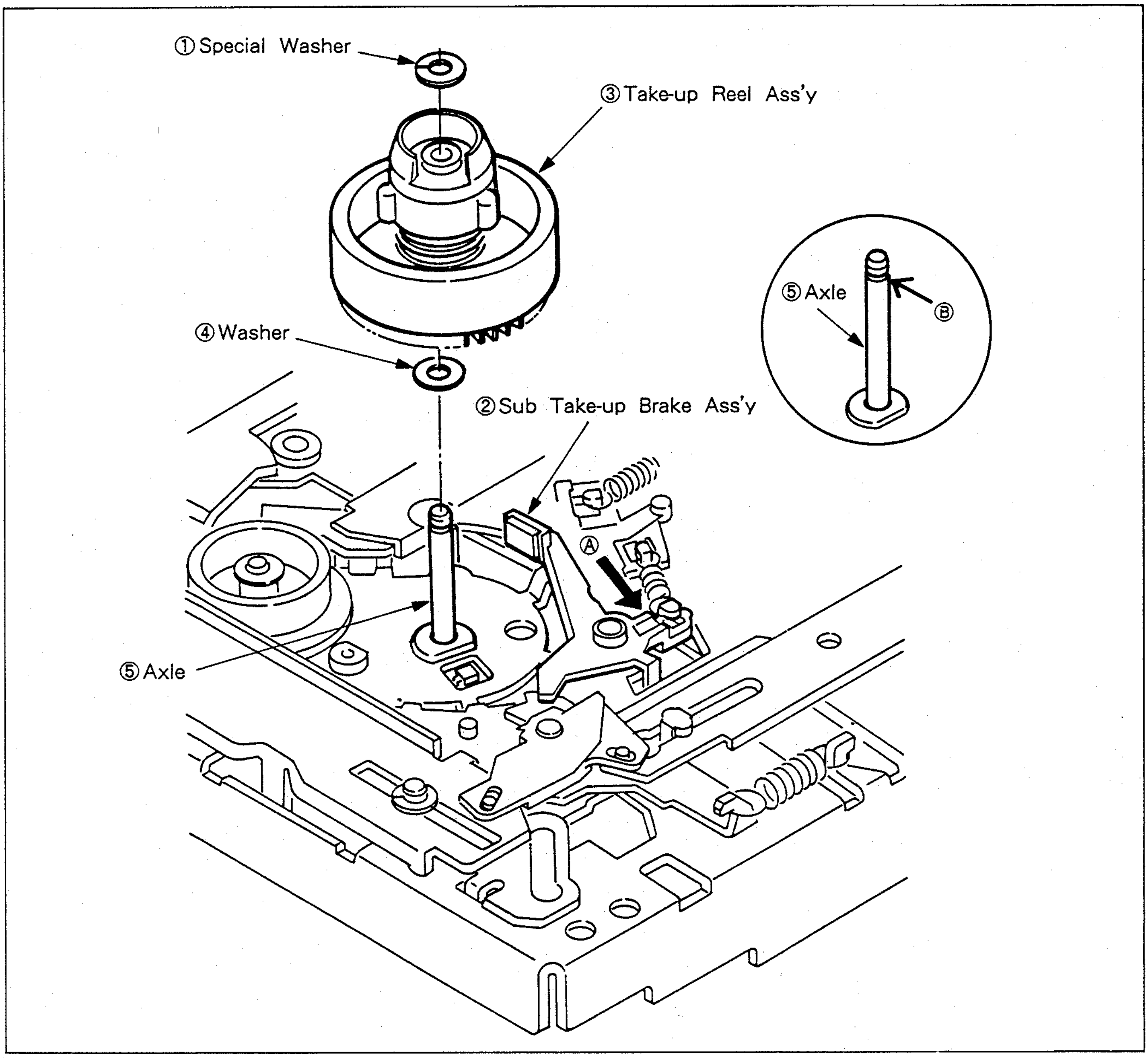


Fig. 5-8-2. Take-up Reel Ass'y

5-8-3. Take-up Reel Gear (See Fig. 5-8-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the TAKE-UP REEL ASS'Y as instructed in 5-8-2.
3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in 5-7-1.
4) Remove the TAKE-UP BRAKE ASS'Y as instructed in 5-7-2.
5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
2) Mount the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
3) Mount the special washer ① onto the axle ⑤.
4) Mount the TAKE-UP BRAKE ASS'Y as instructed in 5-7-2.
5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in 5-7-1.
6) Mount the TAKE-UP REEL ASS'Y as instructed in 5-8-2.
7) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

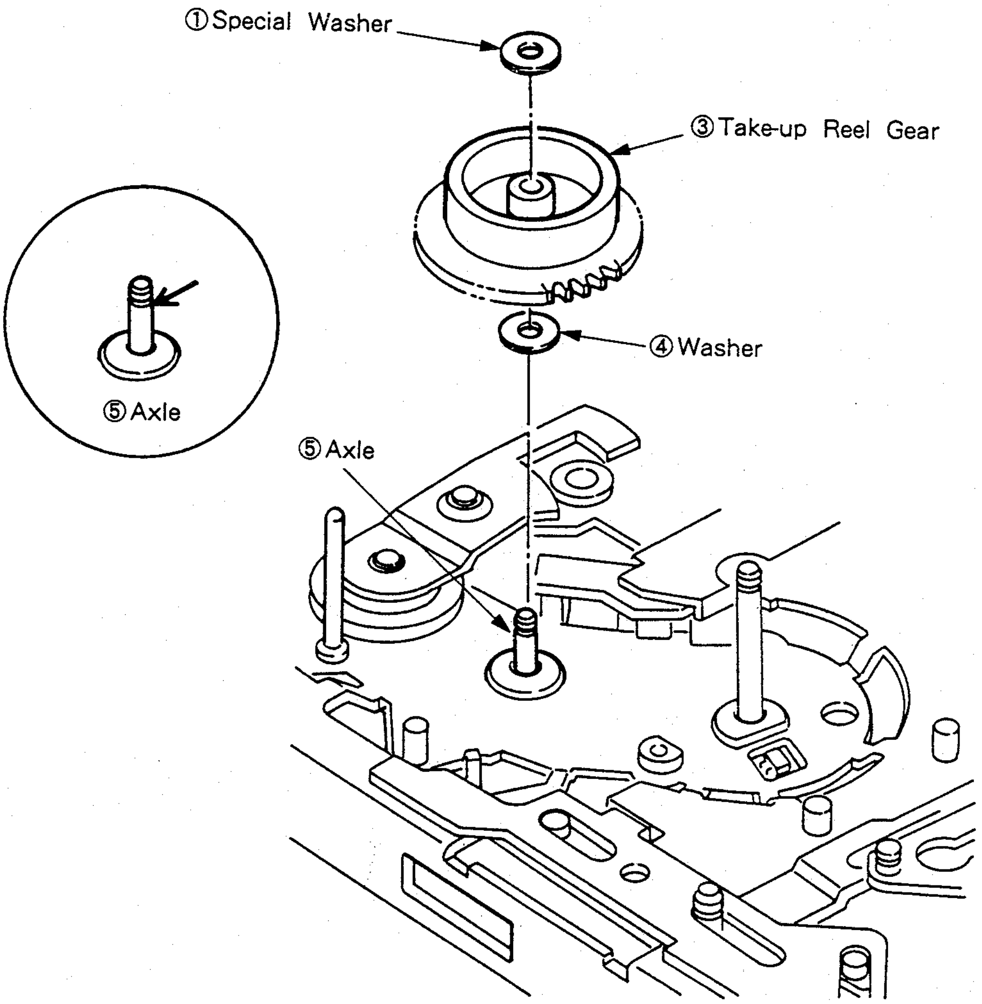


Fig. 5-8-3. TaKe-up Reel Gear

5-8-4. Reel Pulley and Friction Gear Ass'y (See Fig. 5-8-4.)

1. Removal

1) Remove the two screws ①, then remove the PULLEY BRACKET ②.
2) Remove the REEL DRIVE BELT ③.
3) Remove the special washer ④, then remove the REEL PULLEY ⑤.
4) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

2. Remounting

1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with an arrow.
2) Mount the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
3) Mount the special washer ⑥ onto the axle ⑨.
4) Mount the REEL PULLEY ⑤ onto the axle ⑩.
5) Mount the special washer ④ onto the axle ⑩.
6) Set the REEL DRIVE BELT ③.
7) Mount the PULLEY BRACKET ② with the two screws ①.

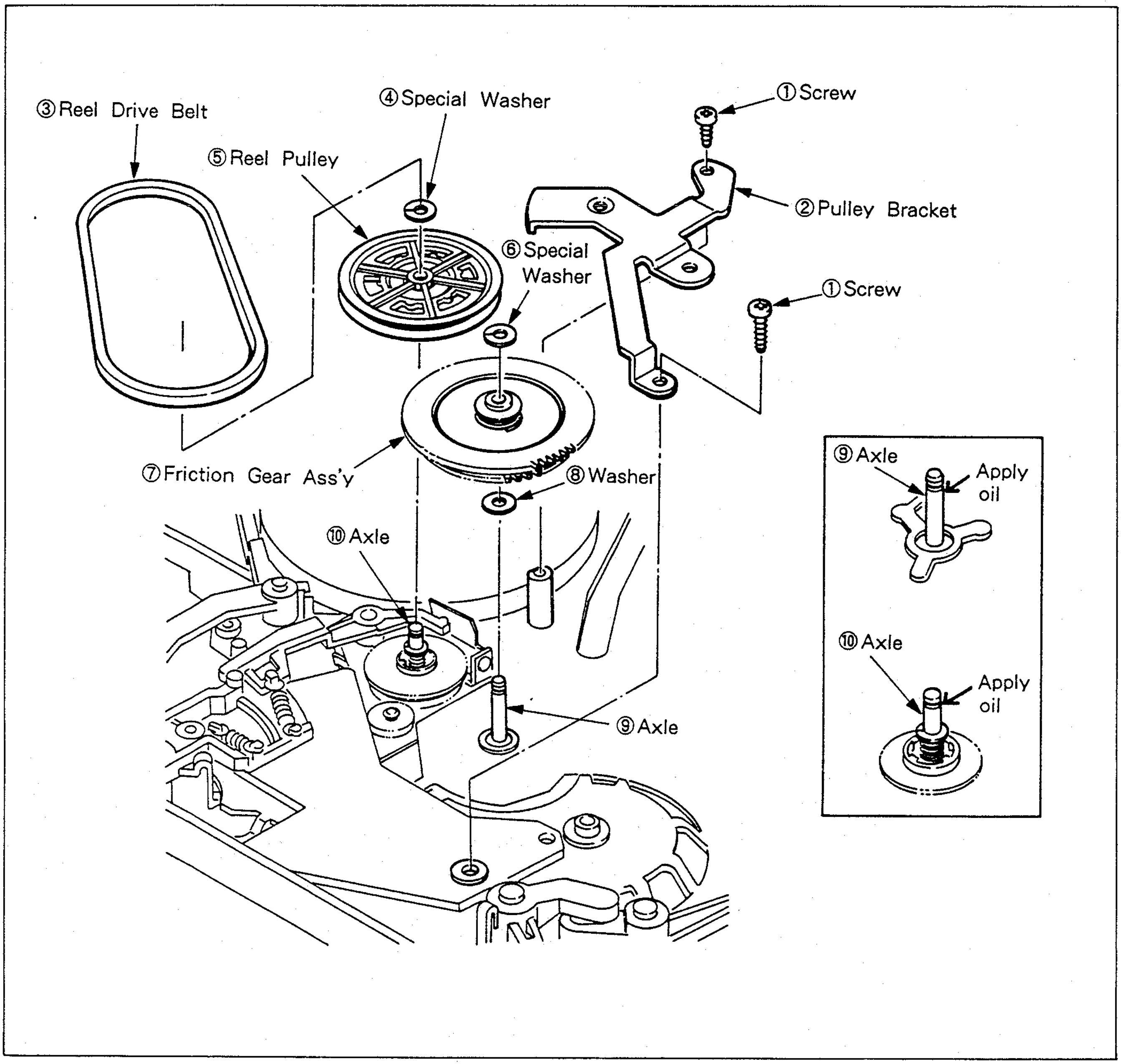

③Reel Drive Belt
④Special Washer
①Screw
⑤Reel Pulley
②Pulley Bracket
⑥Special Washer
①Screw
⑦Friction Gear Ass'y
⑧Washer
⑩Axle
⑨Axle
⑨Axle
Apply oil
⑩Axle
Apply oil

Fig. 5-8-4. Reel Pulley & Friction Gear

5-8-5. COMPL Clutch (See Fig. 5-8-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
3) Remove the screw ①, then remove the COMPL MC-4 ②.
4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

2. Remounting

1) Mount the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.
2) After inserting the CN831 (COMPL MC-4) into the CN801 (COMPL MC-1), mount the COMPL MC-4 with the screw ①.
3) Mount the REEL PULLEY, the REEL DRIVE BELT and the PULLEY BRACKET as instructed in 5-8-4.
4) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

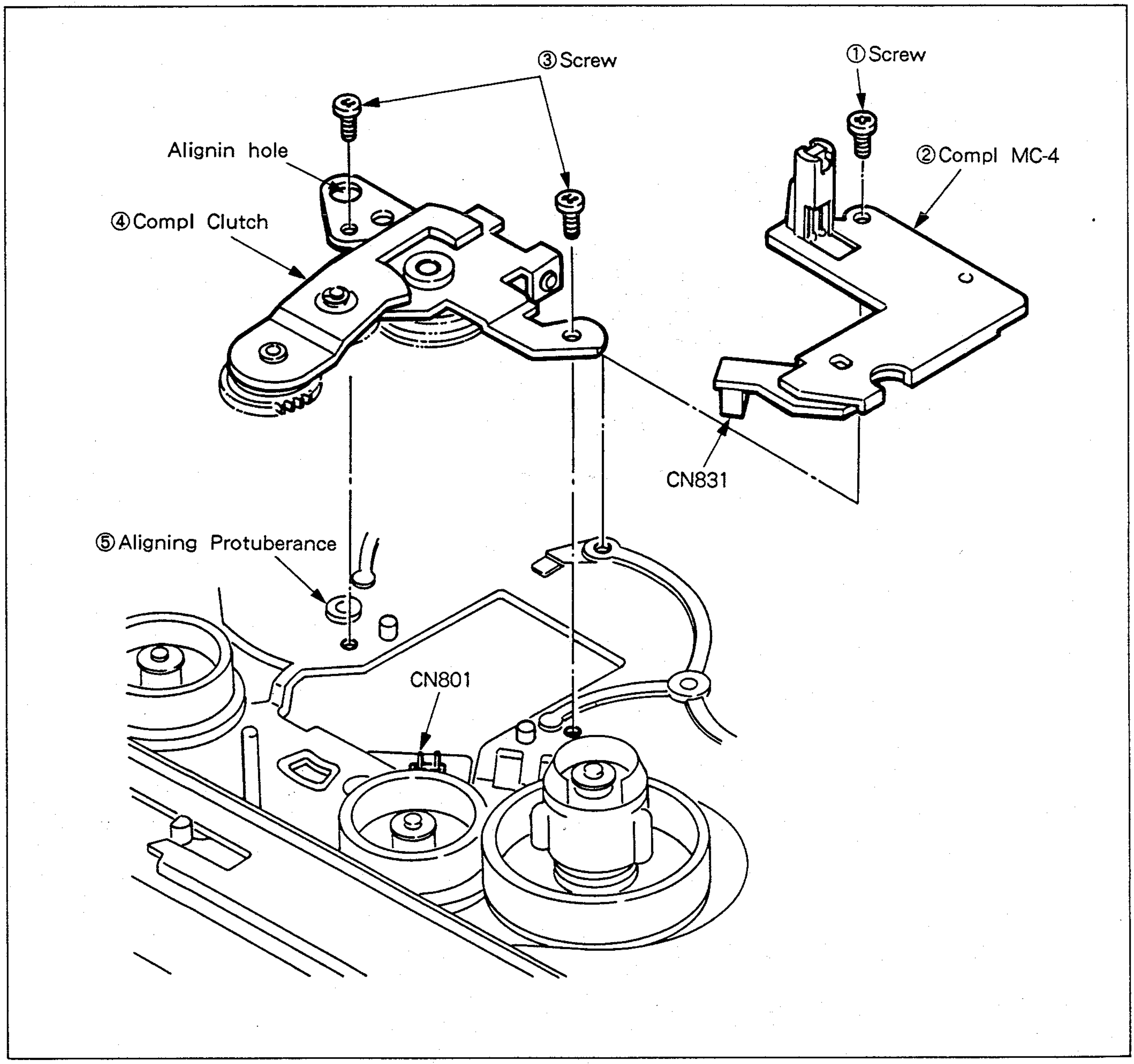

③Screw
①Screw
Alignin hole
②Compl MC-4
④Compl Clutch
CN831
⑤Aligning Protuberance
CN801

Fig. 5-8-5. Compl Clutch

5-8-6. Clutch Change Lever and Clutch Lever Ass'y (See Fig. 5-8-6.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
3) Remove the SPRING COIL ①.
4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
5) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting

1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
2) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
3) Hook the SPRING COIL ① between the hooks ⑨ and ⑩.
4) Mount the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 5-8-4.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.

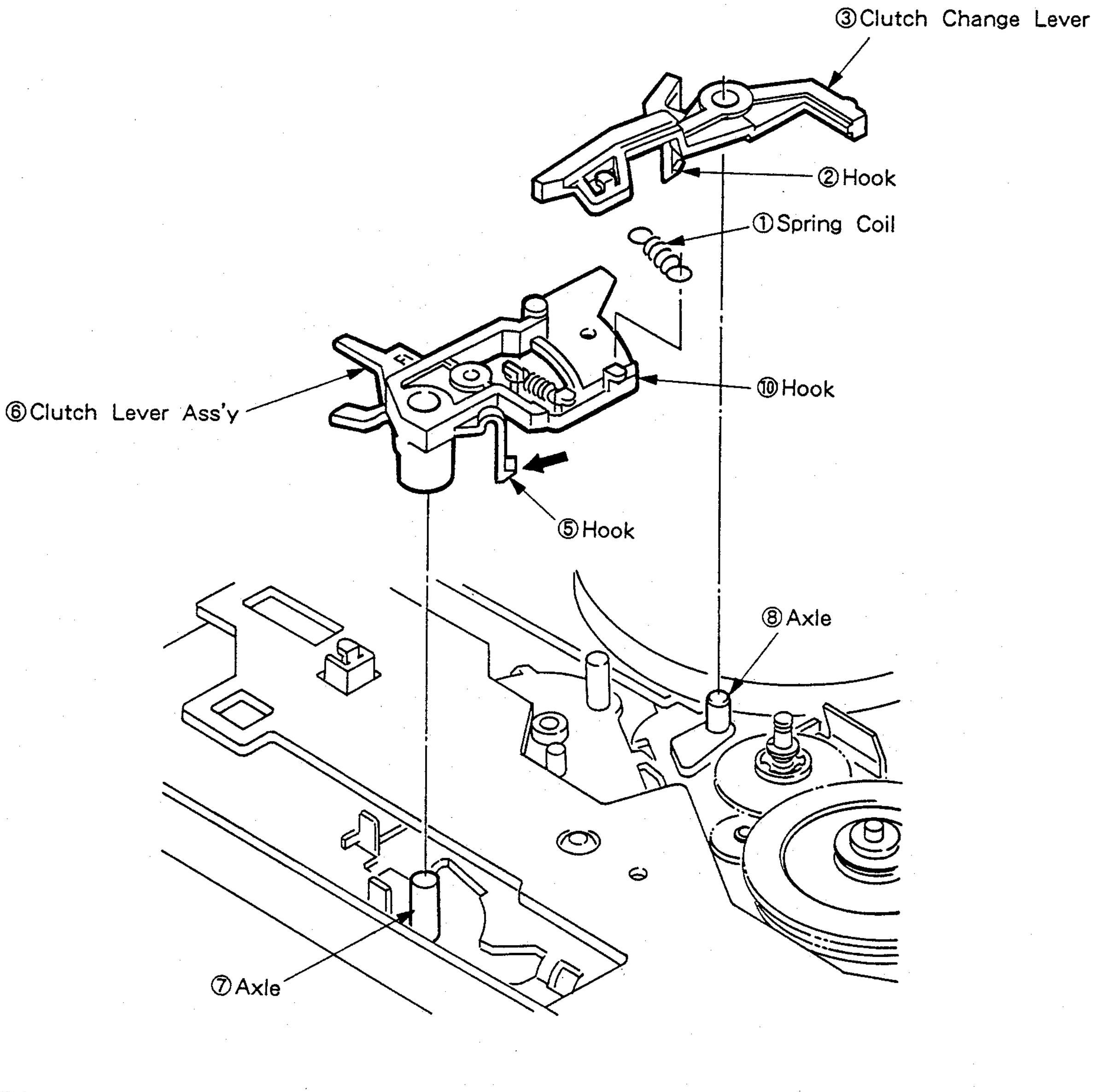


Fig. 5-8-6. Clutch Change Lever & Clutch Lever Ass'y

5-9. CAPSTAN MOTOR (See Fig. 5-9-1.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.
2) Remove the CAPSTAN MOTOR ⑥ connector.
3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
4) Remove the two screws ④ fixing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note : Take care not to scratch or soil the capstan axle.

2. Remounting

1) Mount the CAPSTAN MOTOR ⑥ with the three screws ⑤.
2) Connect the CAPSTAN MOTOR ⑥ connector.
3) Mount the TOP BOARD ③ with the two screws ④.
4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 5-7-4.

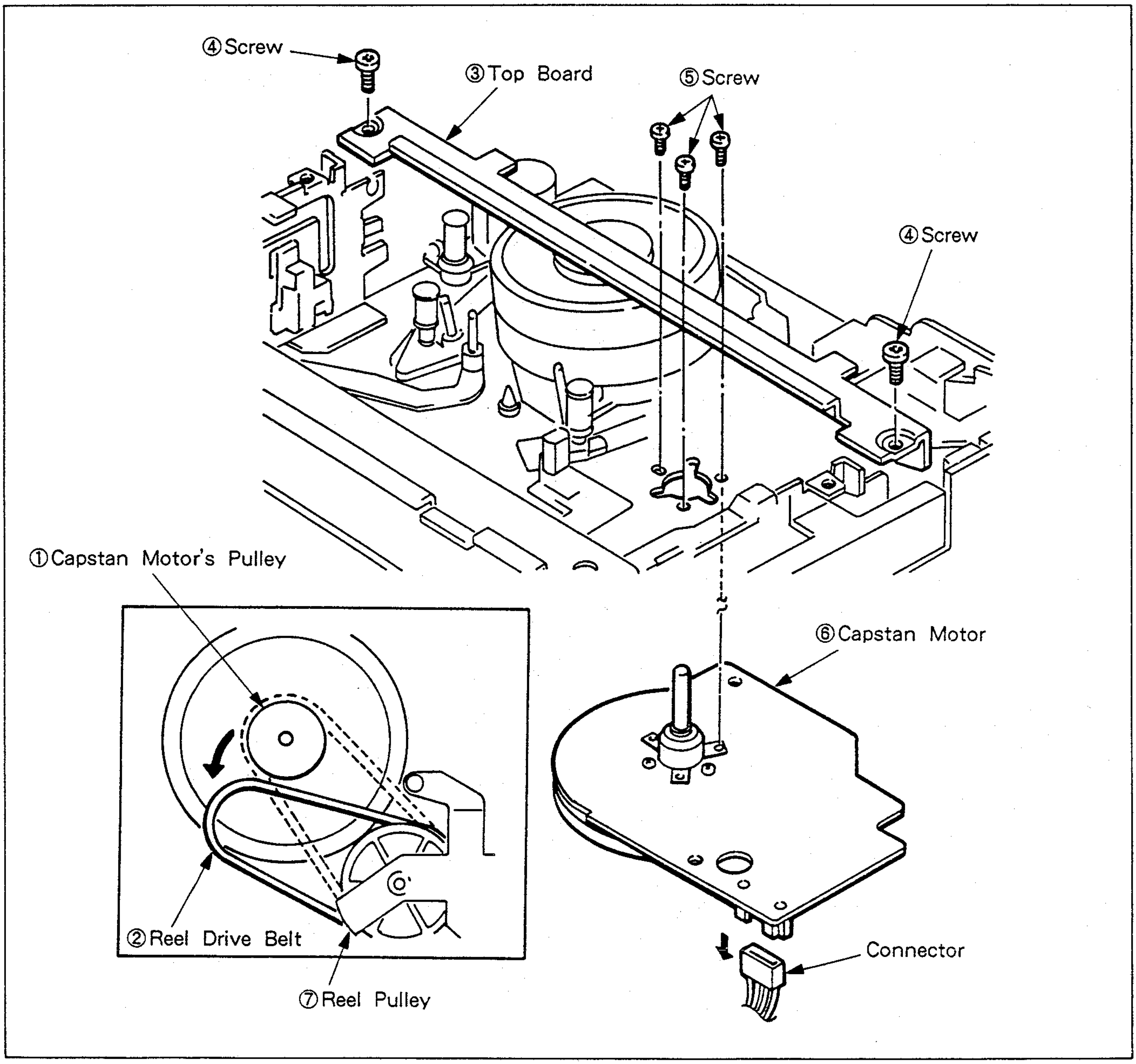

④Screw
③Top Board
⑤Screw
④Screw
①Capstan Motor's Pulley
⑥Capstan Motor
②Reel Drive Belt
Connector
⑦Reel Pulley

Fig. 5-9-1. Capstan Motor

5-10. FIXED GUIDE, FE HEAD LEVER ASS'Y

5-10-1. Entrance side Fixed Guide and FE Lever Ass'y (See Fig. 5-10-1.)

1. Removal

1) Remove the SP NUT ①, then remove the GUIDE PIPE ③ and the SP washer ② (lower), in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector.
4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.

Note : A SP washer ⑪ (upper) and a SPRING COIL ④ are sometimes inserted between the SP NUT ① and the special washer ⑥. In this case, put it back in its original position when remouting the entrance side fixed guide.

2. Remounting

1) After mounting the FE LEVER ASS'Y ⑦ onto the axle ⑧, mount the special washer ⑥.
2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
3) Mount the SP washer ② (lower), the GUIDE pipe ③ and the SP NUT ① to the axle ⑧, in that order.
4) Connect the connector to the FTE HEAD.
5) Perform hight adjustment of the entrance side fixed guide (S) as instructed in 6-4 when remounted the SPRING COIL ④ and the SP washer ⑪ (upper).

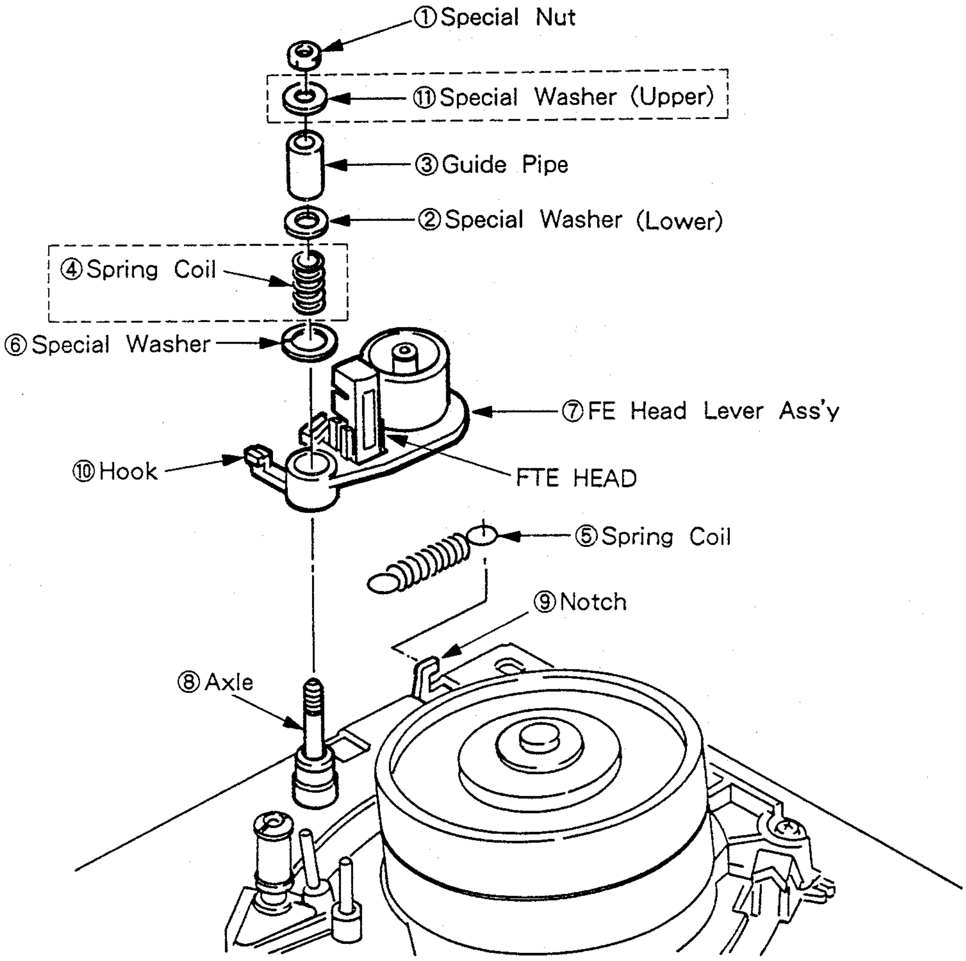

①Special Nut
⑪Special Washer (Upper)
③Guide Pipe
②Special Washer (Lower)
④Spring Coil
⑥Special Washer
⑦FE Head Lever Ass'y
⑩Hook
FTE HEAD
⑤Spring Coil
⑨Notch
⑧Axle

Fig. 5-10-1. Fixed Guide (S) & FE Lever Ass'y

5-10-2. Impedance Roller, FTE Head (See Fig. 5-10-2.)

1. Removal

1) Remove the FTE HEAD (full track erase head) ① connector.
2) Remove the special washer ②, then remove the IMPEDANCE ROLLER ③ and the washer ④.
3) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note : Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting

1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
2) Mount the washer ④ and the IMPEDANCE ROLLER ③, in that order, onto the axle ⑦, then mount the special washer ②.
3) Connect the connector to the terminal of the FTE HEAD ①.

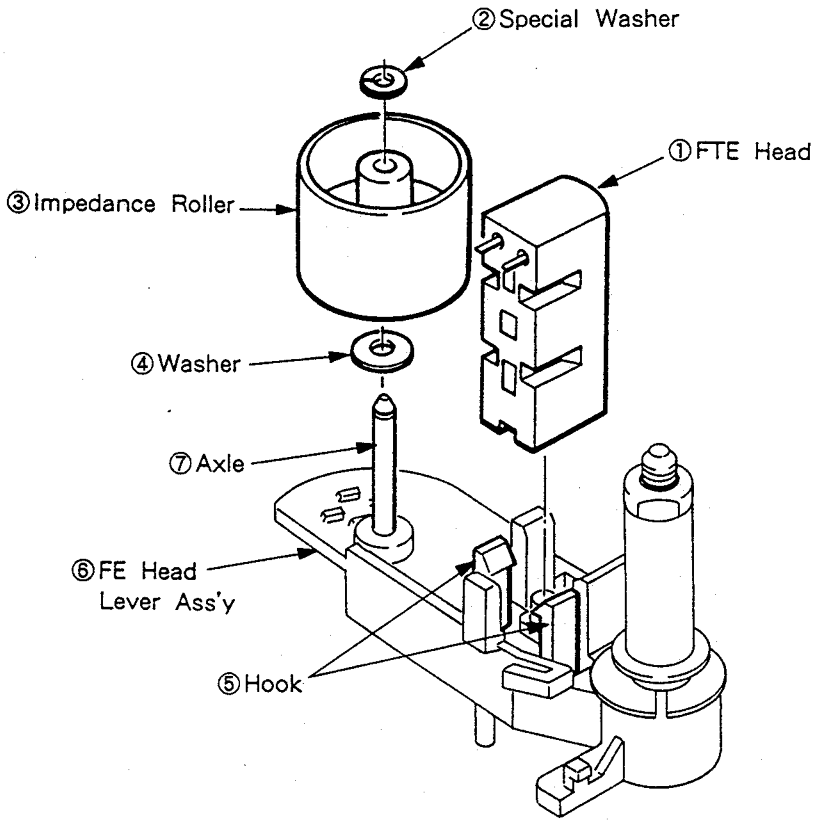

②Special Washer
①FTE Head
③Impedance Roller
④Washer
⑦Axle
⑥FE Head Lever Ass'y
⑤Hook

Fig. 5-10-2. Impedance Roller & FTE Head

5-10-3. Exit side Fixed Guide (See Fig. 5-10-3.)

1. Removal

1) Remove the CAP ①.
2) Remove the SP NUT ②, then remove the SP washer ③ (upper), the GUIDE PIPE ④, the SP washer ③ (lower) and the SPRING COIL ⑤, in that order.

2. Remounting

1) Mount the SPRING COIL ⑤, the SP washer ③ (lower), the GUIDE PIPE ④, the SP washer ③ (upper) and the SP NUT ②, in that order, to the axle ⑥.
2) Mount the CAP ① onto the axle ⑥.
3) Perform height adjustment of the fixed guide (T) as instructed in 6-4.

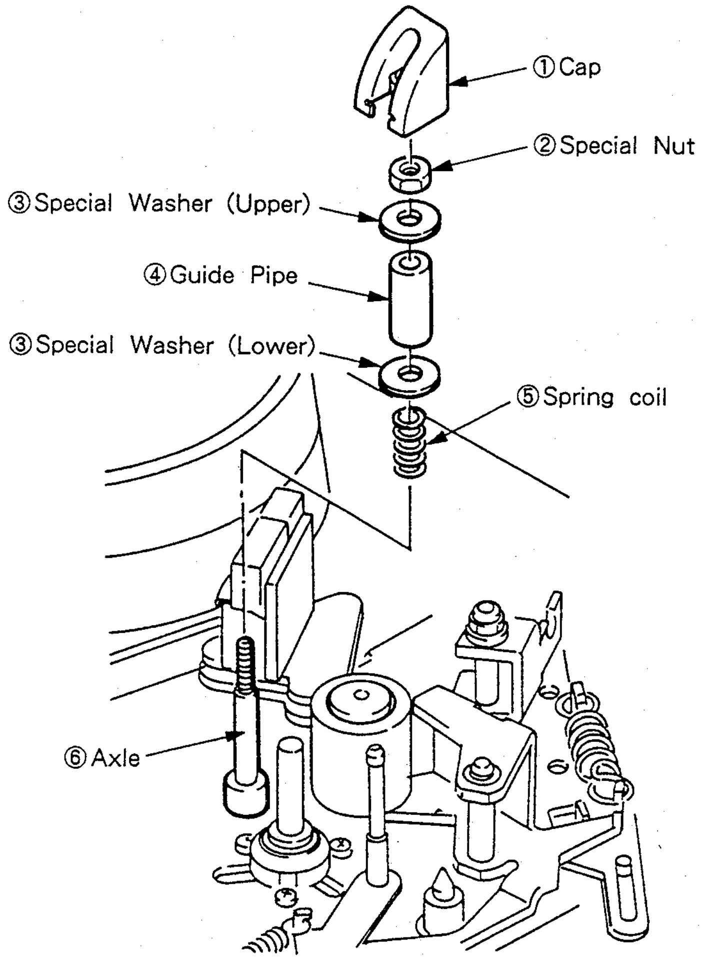

①Cap
②Special Nut
③Special Washer (Upper)
④Guide Pipe
③Special Washer (Lower)
⑤Spring coil
⑥Axle

Fig. 5-10-3. Fixed Guide (T)

5-11. DRUM SECTION

5-11-1. Drum Motor (rotor, stator) (See Fig. 5-11-1.)

1. Removal

1) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.
2) Remove the two screws ③, then remove the ROTOR ④ and SPACER.
3) Remove the STATOR board connector ⑩.
4) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

1) Mount the STATOR ⑥ with the three screws ⑤.
2) Mount the SPACER ⑪ on to the AXLE ⑫.
3) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, mount the ROTOR with the two screws ③.
4) Insert the connector ⑩.
5) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, mount it with the screw ①.

Note 1 : Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3kg-cm.

Note 2 : When the drum unit has been replaced, perform a tape path adjustment as instructed in 6-4. and perform a CH-1/CH-2 switching position adjustment of the servo circuit.

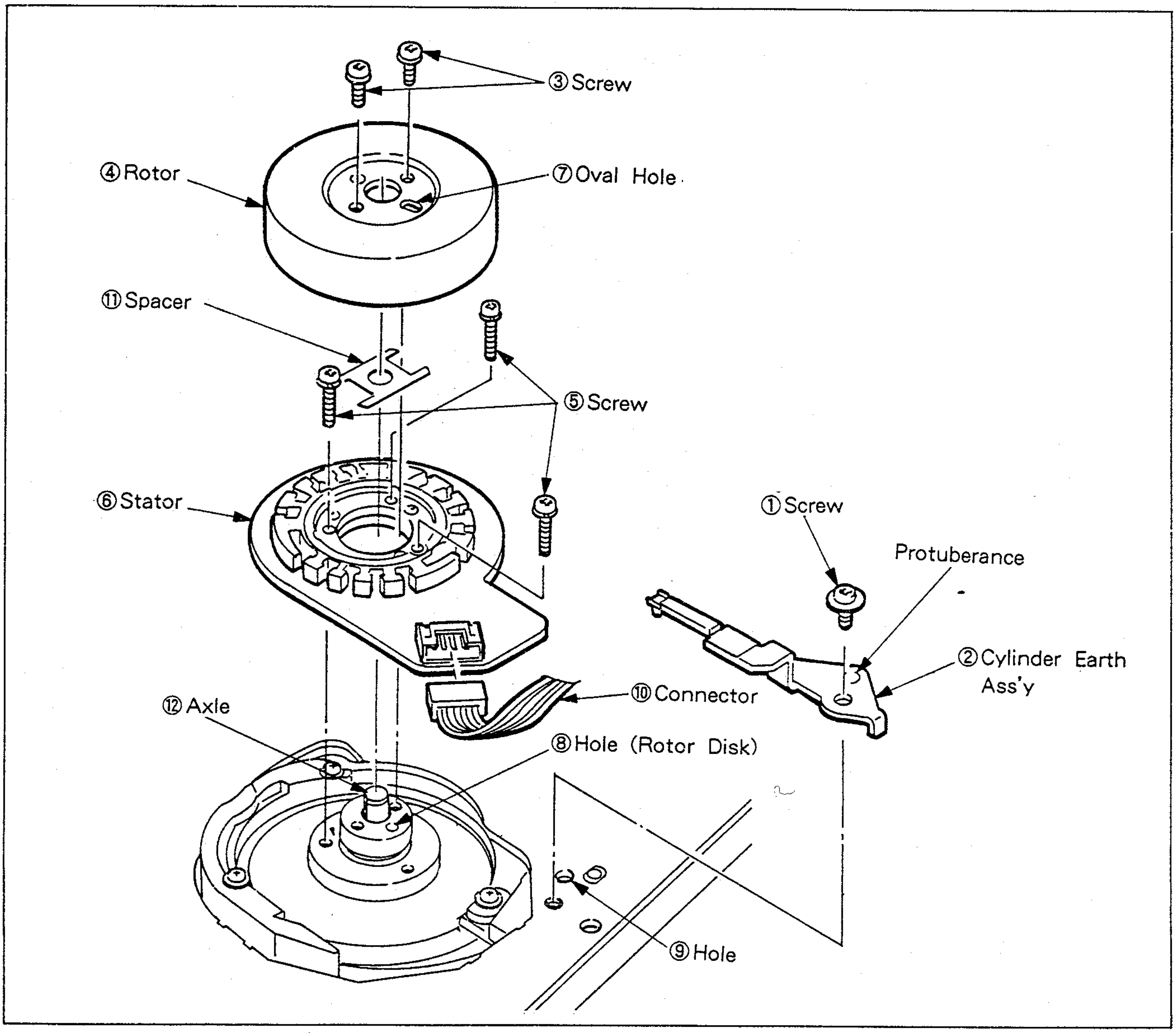

③Screw
④Rotor
⑦Oval Hole
⑪Spacer
⑤Screw
⑥Stator
①Screw
Protuberance
②Cylinder Earth Ass'y
⑩Connector
⑫Axle
⑧Hole (Rotor Disk)
⑨Hole

Fig. 5-11-1. Drum Motor

5-11-2. Drum Unit (See Fig. 5-11-2.)

1. Removal

1) For some models with the board located above the upper drum, remove the board.
2) Remove the flexible P.C.B. ① from the PRE-AMP UNIT (take care not to pull the flexible P.C.B. in the upward direction).
3) Remove the LOAD RACK only, as instructed in 5-4-1.
4) Remove the three screws ②, then remove the drum unit ③.

NOTE : When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

1) While aligning the drum unit ③ to the protuberance, mount it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.
2) Mount the ROAD RACK as instructed in 5-4-1.
3) Insert the flexible P.C.B. into the PRE-AMP UNIT.
4) Clean the drum unit.
5) Perform the tape path adjustment as instructed in 6-4. and perform the CH-1/CH-2 switching position adjustment of the servo circuit.

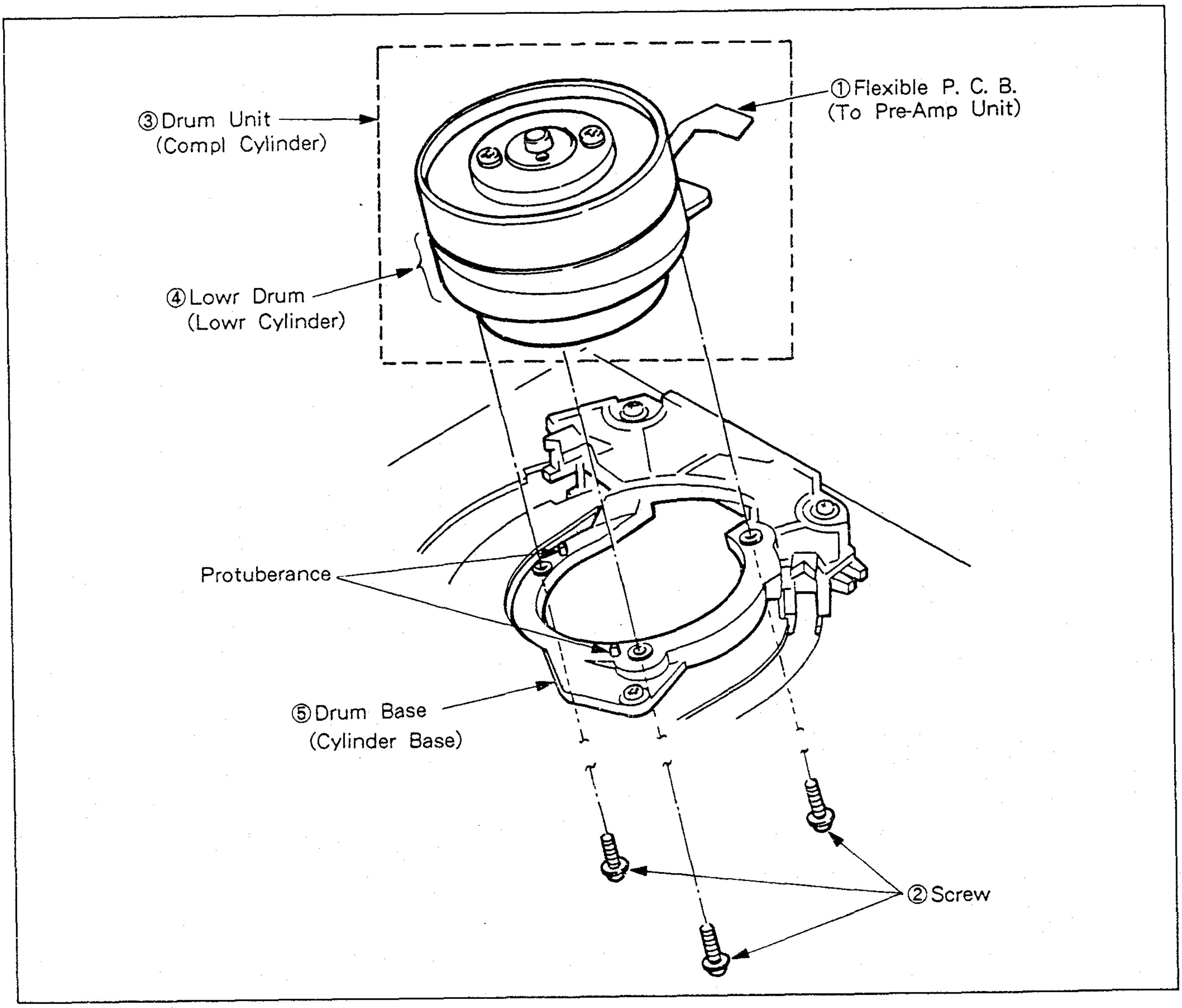

③Drum Unit
(Compl Cylinder)
①Flexible P. C. B.
(To Pre-Amp Unit)
④Lowr Drum
(Lowr Cylinder)
Protuberance
⑤Drum Base
(Cylinder Base)
②Screw

Fig. 5-11-2 Drum Unit (Compl Cylinder)

5-11-3. Upper Drum (Upper Cylinder)

1. Removal

1) Remove the two screws ① (see Fig. 5-11-3).
2) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered from the P.C. board (see Fig. 5-11-4.).
3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③ (see Fig. 5-11-5.).
4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then mount by turning the handle clockwise.
5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
6) Remove the jig from the upper drum.

Note : Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.

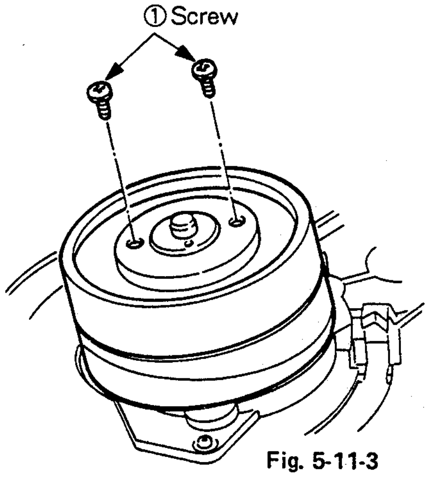


Fig. 5-11-3

Lead wires of
Rotary Erase Head (Model for flying erase capability)

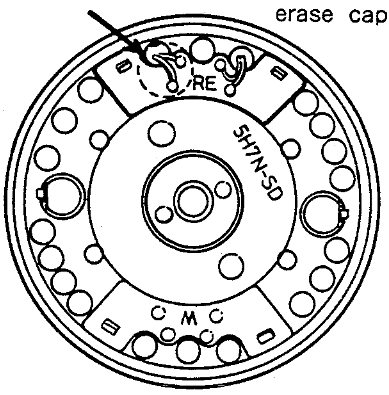

RE
5H7N-SD
C M C

Fig. 5-11-4

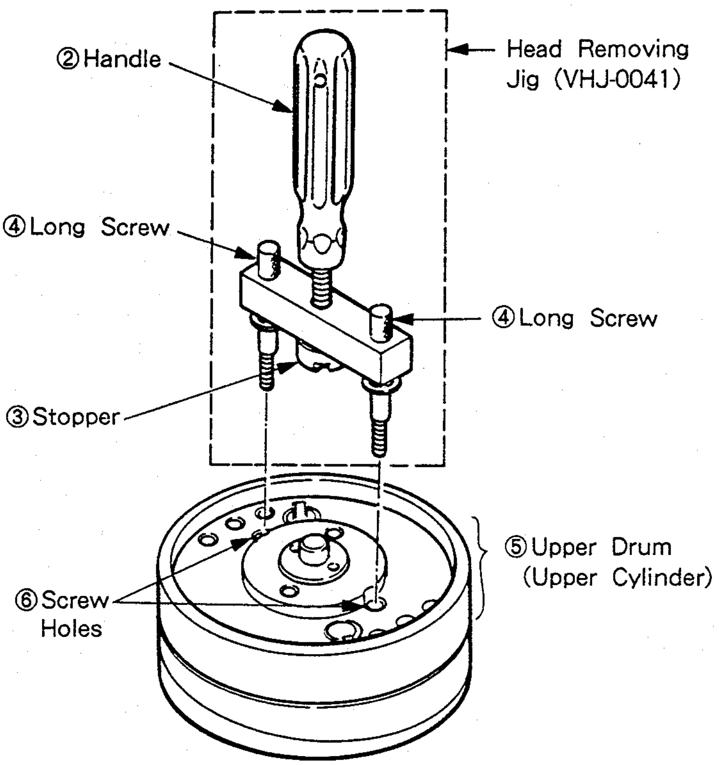

②Handle
Head Removing Jig (VHJ-0041)
④Long Screw
④Long Screw
③Stopper
⑤Upper Drum (Upper Cylinder)
⑥Screw Holes

Fig. 5-11-5

Upper Drum (Upper Cylinder)

2. Remounting (See Fig. 5-11-6.)

1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact portion are free from scratches and dirt.
2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set with in the rotary transformer terminal round hole side ② position of lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head side).
3) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole. (See Fig.5-11-4.)
4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.
5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6kg-cm using a torque driver (VHJ-0014) and a 3mm bit (VHJ-0045).
6) In case the RE head is attached to the upper drum ⑤, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note : When the upper drum has been replaced, perform a tape path adjustment as instructed in 6-4. and CH-1/CH-2 switching position adjustment of the servo circuit.

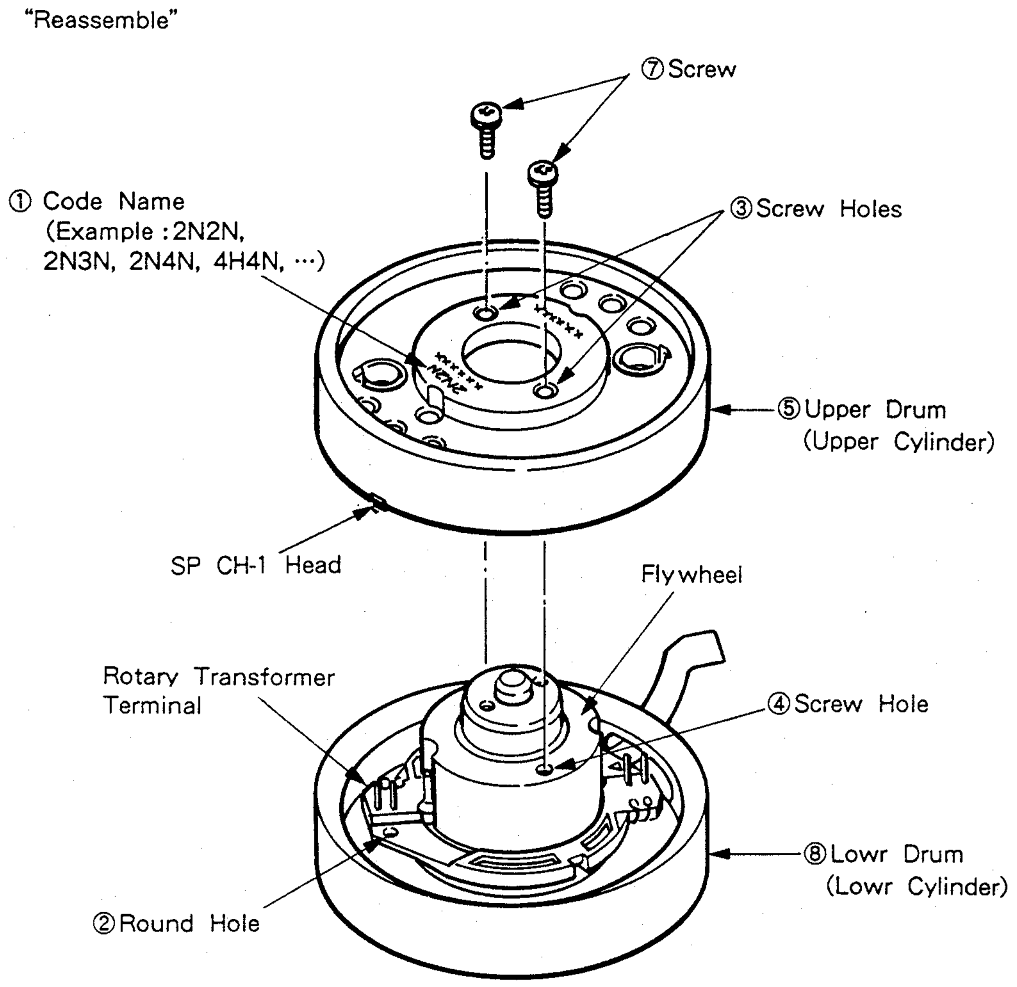

"Reassemble"
⑦Screw
① Code Name (Example : 2N2N, 2N3N, 2N4N, 4H4N, ···)
③Screw Holes
⑤Upper Drum (Upper Cylinder)
SP CH-1 Head
Flywheel
Rotary Transformer Terminal
④Screw Hole
⑧Lowr Drum (Lowr Cylinder)
②Round Hole

Fig. 5-11-6.

3. **Recognizing the SP CH-1 Head Side**
No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, mounting position should be matched when mounting the upper drum. In the P90 mechanism series, the code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 5-11-7.) This code name differs according to the drum type, but its basic form is as follows :

A = Number of head bases
B = "N" for normal audio
"H" for HI-FI audio
C = Number of heads
D = TV system ("N" or "P")
EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.

Code Name Form
④Ⓗ④Ⓟ-ⒹⓈ
A B C D E F

Examples of Detailed Classification Codes
V = Head with level difference
D = Compatible with digital units
S = SVHS-compatible

Examples of Code Names
2N2P, 2N2P-L, 2N2P-V, 2N2P-D, 2N3P, 2N4P, 4H4P, 4H4P-D

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 5-11-8, there are two types of rotary transformer terminals (the number of pins differs according to the number of heads).

Note : When ordering parts such as drums (CYLINDERS), do not use the code names ; always refer to the parts list and order with the specified part numbers.

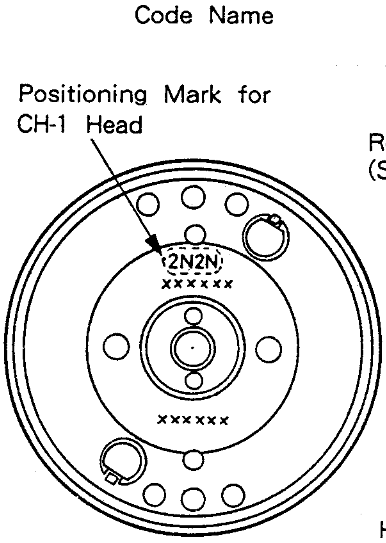

Code Name
Positioning Mark for CH-1 Head
2N2N
xxxxxx
xxxxxx

Fig. 5-11-7. Upper Drum

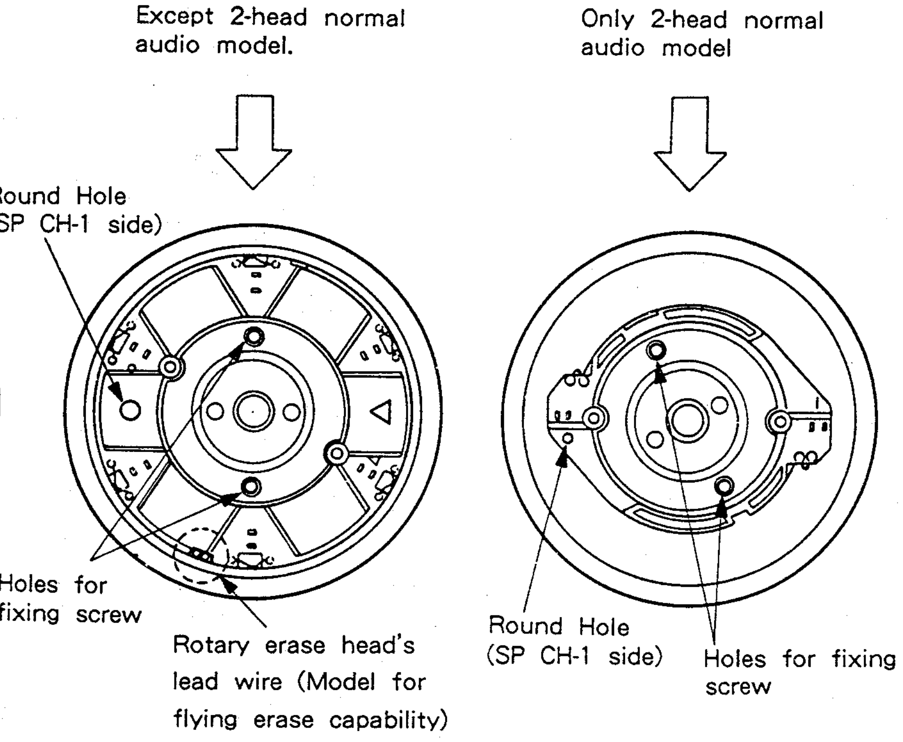
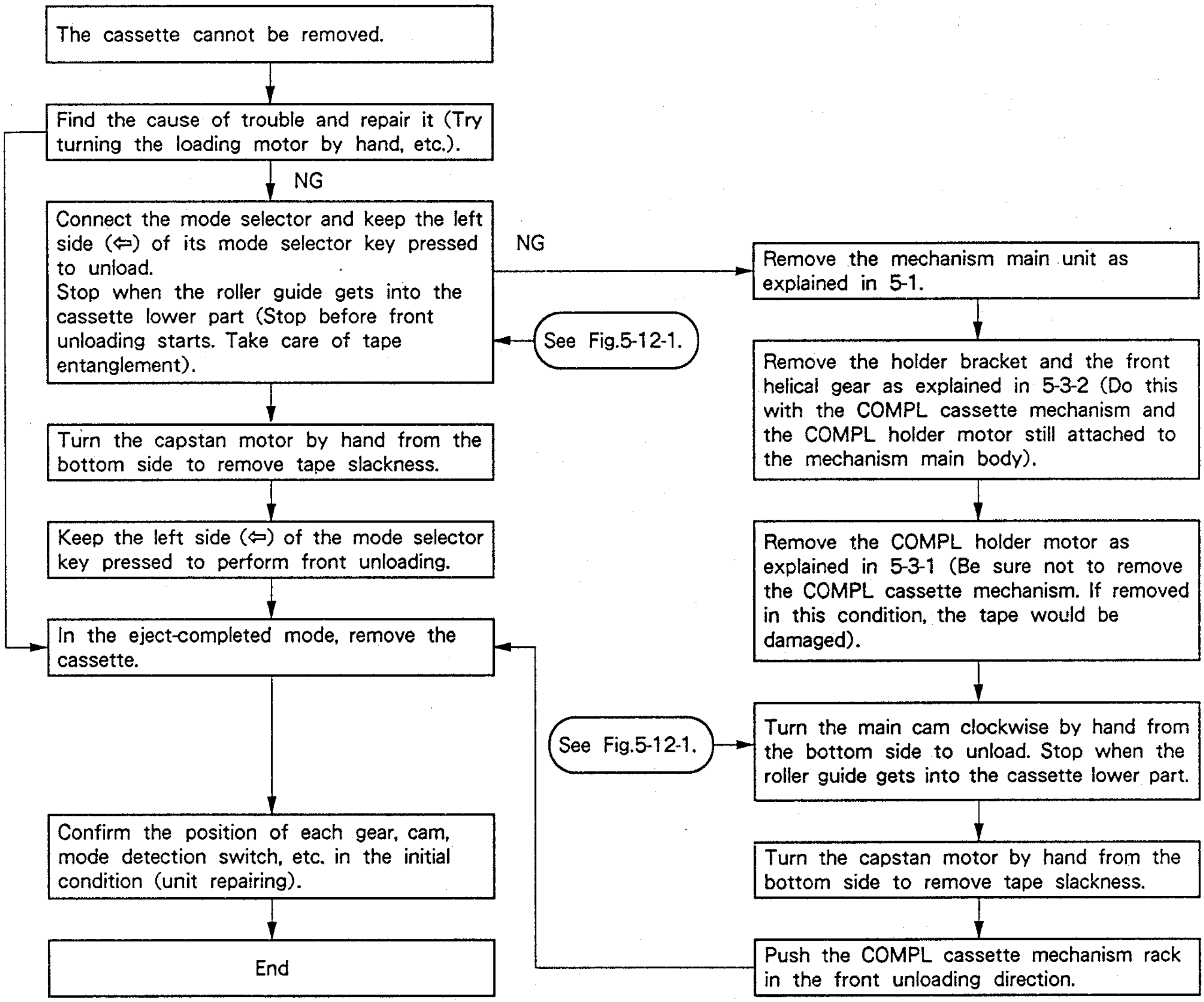

Except 2-head normal audio model.
Only 2-head normal audio model
Round Hole (SP CH-1 side)
Holes for fixing screw
Rotary erase head's lead wire (Model for flying erase capability)
Round Hole (SP CH-1 side)
Holes for fixing screw

Fig. 5-11-8. Lower Drum

5-12. HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED



The cassette cannot be removed.

Find the cause of trouble and repair it (Try turning the loading motor by hand, etc.).

Connect the mode selector and keep the left side (⇐) of its mode selector key pressed to unload.
Stop when the roller guide gets into the cassette lower part (Stop before front unloading starts. Take care of tape entanglement).

Turn the capstan motor by hand from the bottom side to remove tape slackness.

Keep the left side (⇐) of the mode selector key pressed to perform front unloading.

In the eject-completed mode, remove the cassette.

Confirm the position of each gear, cam, mode detection switch, etc. in the initial condition (unit repairing).

End

Remove the mechanism main unit as explained in 5-1.

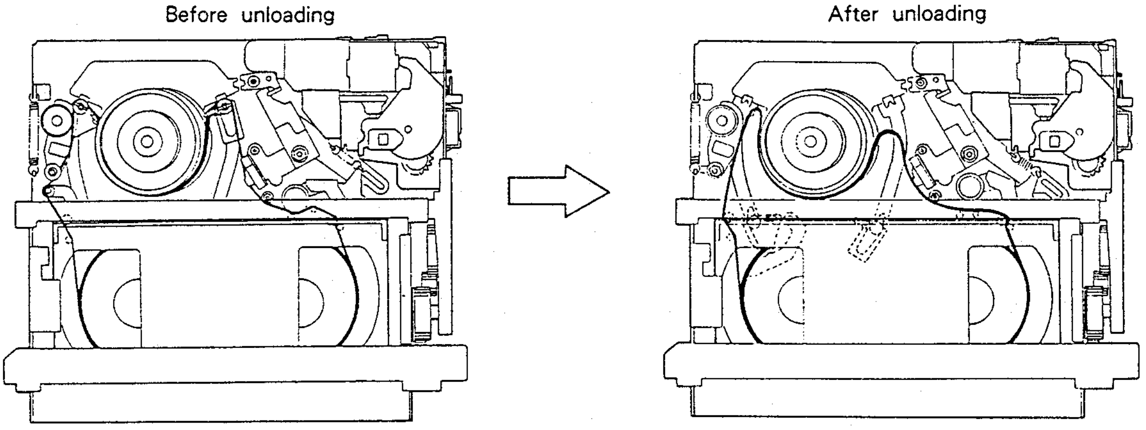
Remove the holder bracket and the front helical gear as explained in 5-3-2 (Do this with the COMPL cassette mechanism and the COMPL holder motor still attached to the mechanism main body).

Remove the COMPL holder motor as explained in 5-3-1 (Be sure not to remove the COMPL cassette mechanism. If removed in this condition, the tape would be damaged).

Turn the main cam clockwise by hand from the bottom side to unload. Stop when the roller guide gets into the cassette lower part.

Turn the capstan motor by hand from the bottom side to remove tape slackness.

Push the COMPL cassette mechanism rack in the front unloading direction.



Perform unloading using the mode selector.

First rotate the capstan motor by hand from the bottom to take-up the tape slack, and perform front-unloading using the mode selector.

Fig. 5-12-1

6. MECHANISM ADJUSTMENT

6-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 6-1-1.)

1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode :	Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.
REW／R-SEARCH :	After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting the INITIAL mode after 2 to 3 seconds.

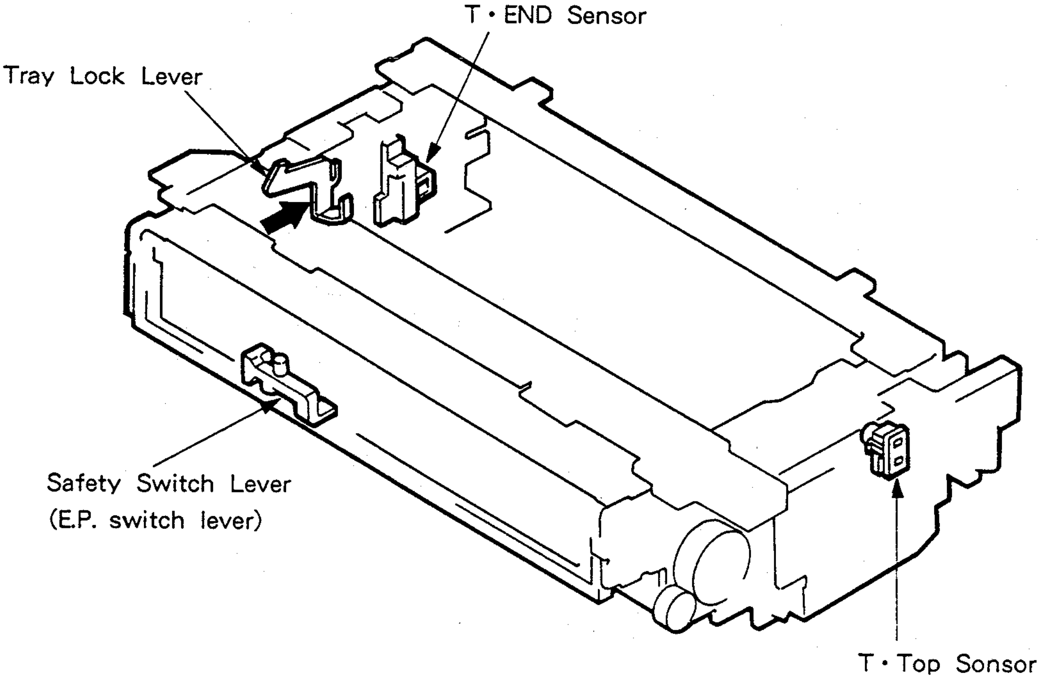


Fig. 6-1-1. Preparations for Adjustment

6-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

6-2-1. Reel Table Height (See Fig. 6-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is replaced, it will be necessary to adjust the REEL TABLE height.

(1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
(2) Attach the cassette stand plate gauge (VHJ-0001) and slide the gauge in the direction of the arrows.
(3) Confirm that, when the gauge stops, the REEL TABLEs are not in contact with surface A of the plate and are in contact with surface B.
(4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.
(5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.
(6) Remove the cassette stand plate gauge.
(7) Set the EJECT mode with the mode selector.
(8) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.

Note :

- Adjust the reel table height by adding or removing spacers (0.13t, 0.25t, 0.3t, 0.4t and 0.5t) as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
  (The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

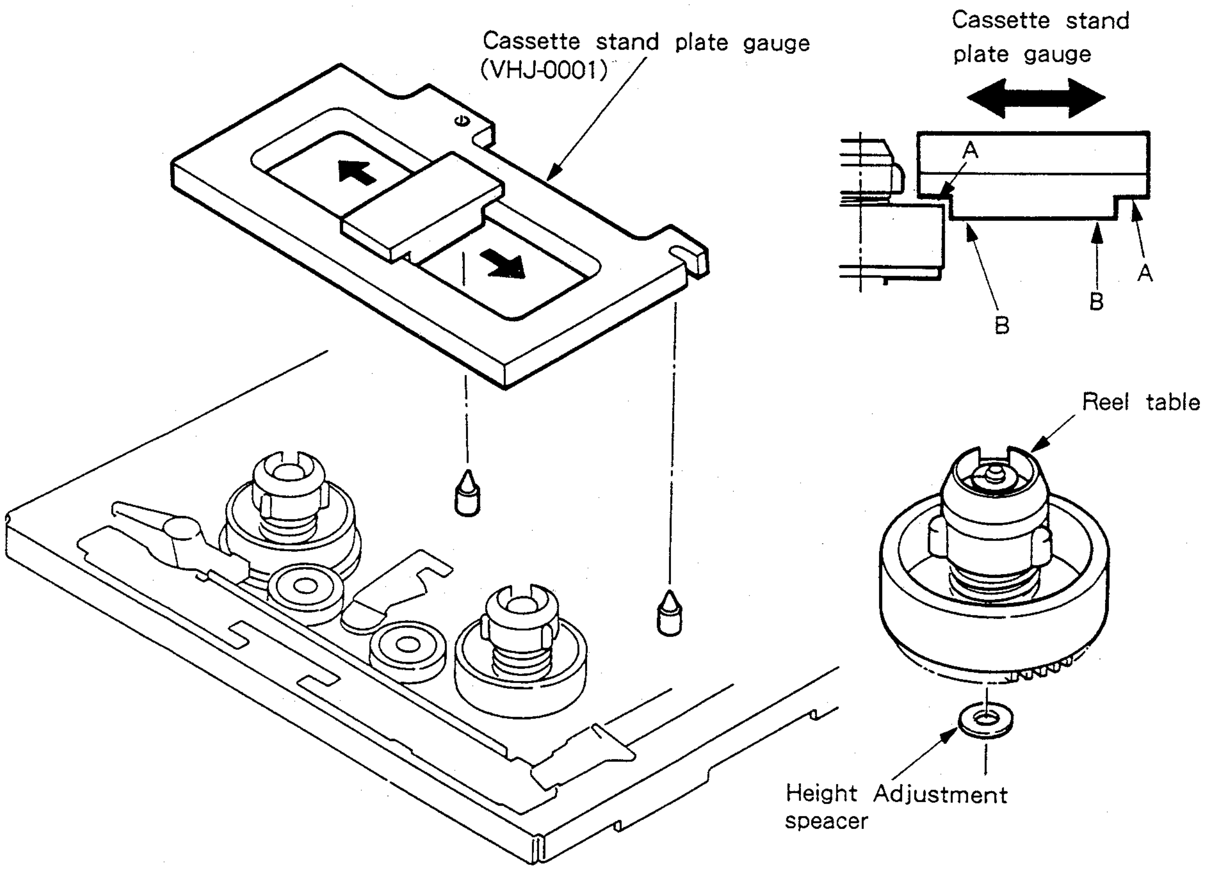

Cassette stand plate gauge (VHJ-0001)
Cassette stand plate gauge
A
B
B
A
Reel table
Height Adjustment speacer

Fig. 6-2-1 . Reel Table Height Adjustment

6-2-2. Torque Check (See Fig. 6-2-2.)

1) Set the unit to operating condition without a cassette inserted as instructed in 6-1.
2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 750gcm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).
3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600gcm or more (locked torque).
4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 100 through 160gcm (locked torque).
5) Measure the SUPPLY REEL TABLE torque in the REV (F-SEARCH) mode, and confirm that it is within 150 through 240 gcm (locked torque).
6) After confirming that torque readings are within the specifications for each mode, check the following :
   - ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
   - ⓑ Deterioration of the REEL DRIVE BELT.
   - ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
   - ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note1 : Items ⓑ, ⓒ and ⓓ require replacement if found defective.

Note2 : The measured value of torque during FF and REW represents the value 2 seconds after starting.

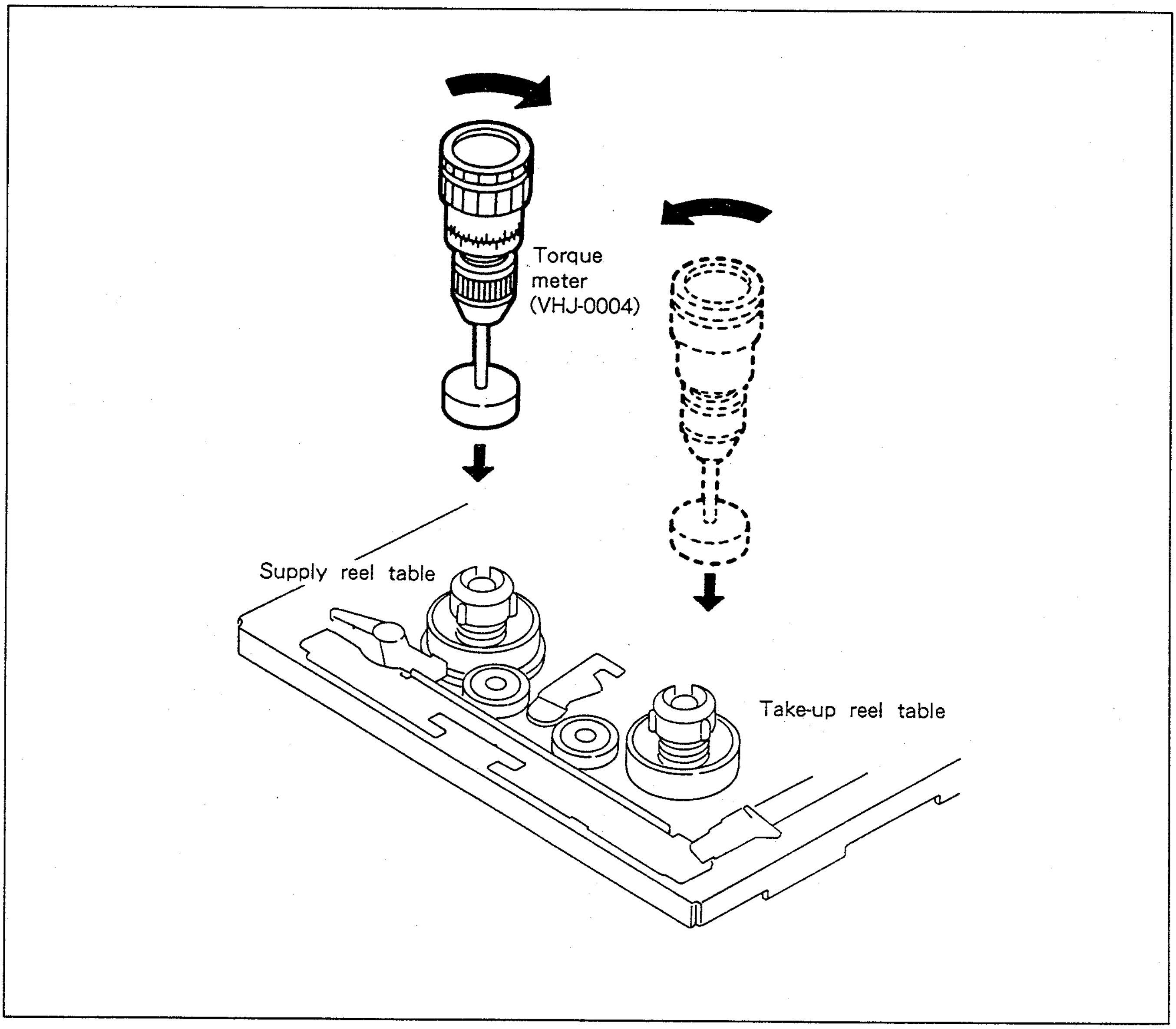


Fig. 6-2-2 Checking REW/FF/PLAY Torque

6-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

6-3-1. Tension Pole (Back Tension Guide) Position Adjustment (See Fig. 6-3-1.)

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Set the PLAY mode with the mode selector (VHJ-0050).
3) Attach the position adjustment gauge (VHJ-0049) ①.
4) Confirm that the tension pole ② is within the position adjustment gauge frame.
5) In case the tension pole is not within the above-mentioned frame, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow Ⓐ.
6) Remove the position adjustment gauge ①.
7) Set the EJECT mode with the mode selector.
8) Mount the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
9) Confirm that back tension torque is within 50 ± 10gcm, as instructed in 6-3-2 below.

6-3-2. Back Tension Torque Check (See Fig. 6-3-1.)

1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
2) Confirm that back tension torque is within 47 ± 5gcm.
3) In case back tension torque does not meet the above specification, proceed as follows:

ⓐ Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.

ⓑ Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ does not make wear and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in 5-7-3.

ⓒ Replace the TENSION LEVER ASS'Y SPRING COIL ⑧.

Note : Always follow procedures in 6-3-1. Tension Pole Position Adjustment after performing ⓐ, ⓑ and ⓒ.

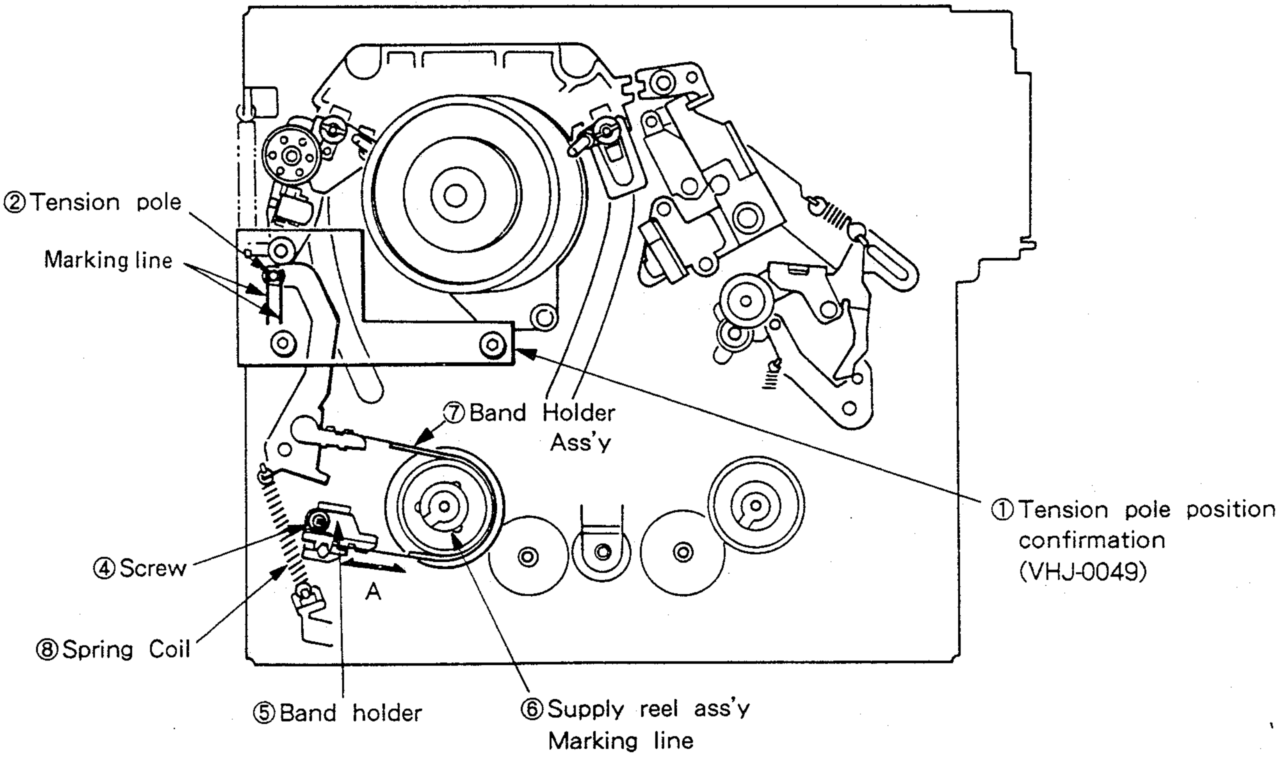

②Tension pole
Marking line
⑦Band Holder Ass'y
①Tension pole position confirmation (VHJ-0049)
④Screw
A
⑧Spring Coil
⑤Band holder
⑥Supply reel ass'y Marking line

Fig. 6-3-1. Tension Pole Positioning Adjustment

6-4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 6-4-1.) have been removed or replaced after a long period of use.
This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.
Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

6-4-1. Preparations for Adjustment

(1) Clean the tape transport surfaces (See Fig. 6-4-1.).
(2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the SW30 (RF SW P) test point. During adjustment, apply a trigger to the low side of the SW30 (RF SW P) in order to monitor the waveform output from channel 1 of the video head.

Note : Since oscilloscope connection points differ according to the model, refer to the "Test Point for Tape Path Adjustment" allocation figure in the electric circuit adjustment section of the service manual book.

(3) Use a dentist's mirror for visual observation of tape path condition.
(4) Use a nut box (VHJ-0048) for adjustment of the fixed guides.
(5) Use an eccentric driver (VHJ - 0003) for adjustment of the guide rollers.
(6) When adjusting height of the fixed guide, guide rollers or COMPL head bracket, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.
(7) Do not use the damaged cassette tapes for tape path adjustment.

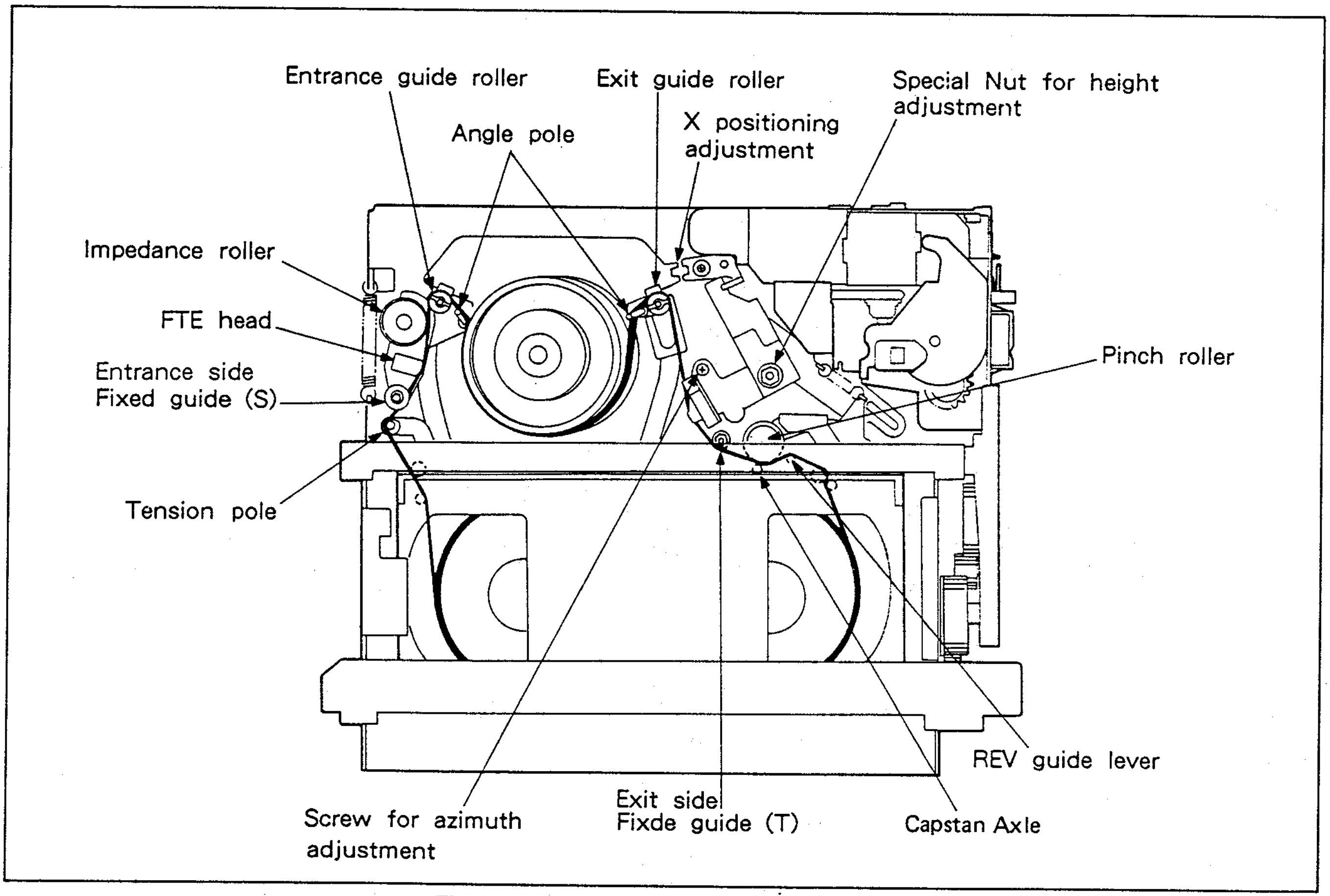

Entrance guide roller
Exit guide roller
Special Nut for height adjustment
Angle pole
X positioning adjustment
Impedance roller
FTE head
Entrance side Fixed guide (S)
Tension pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Exit side Fixde guide (T)
Capstan Axle

Fig. 6-4-1. Preparation for Adjustment

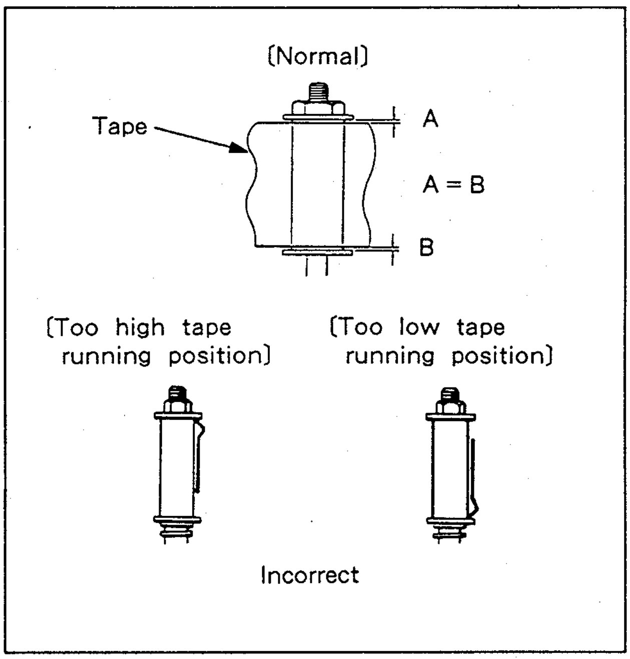
6-4-2. Adjustment by Visual Observation after Guide Roller, Fixed Guide or COMPL Head Bracket Replacement

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (VHJ-0009) beforehand and adjust height by visual observation.

(1) Exit Side Fixed Guide (See Fig. 6-4-2.)
Adjust so that the tape upper edge does not make contact with the fixed guide upper flange, and the tape lower edge does not make contact with the fixed guide lower flange. Gaps A and B should remain equal.

(2) Guide Rollers (See Fig. 6-4-3.)
The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note : An excessive guide roller pressure may cause tape damage.


〔Normal〕
Tape
A
A = B
B
〔Too high tape running position〕
〔Too low tape running position〕
Incorrect

6-4-2. (1) Pre-set For Exit Side Fixed Guide

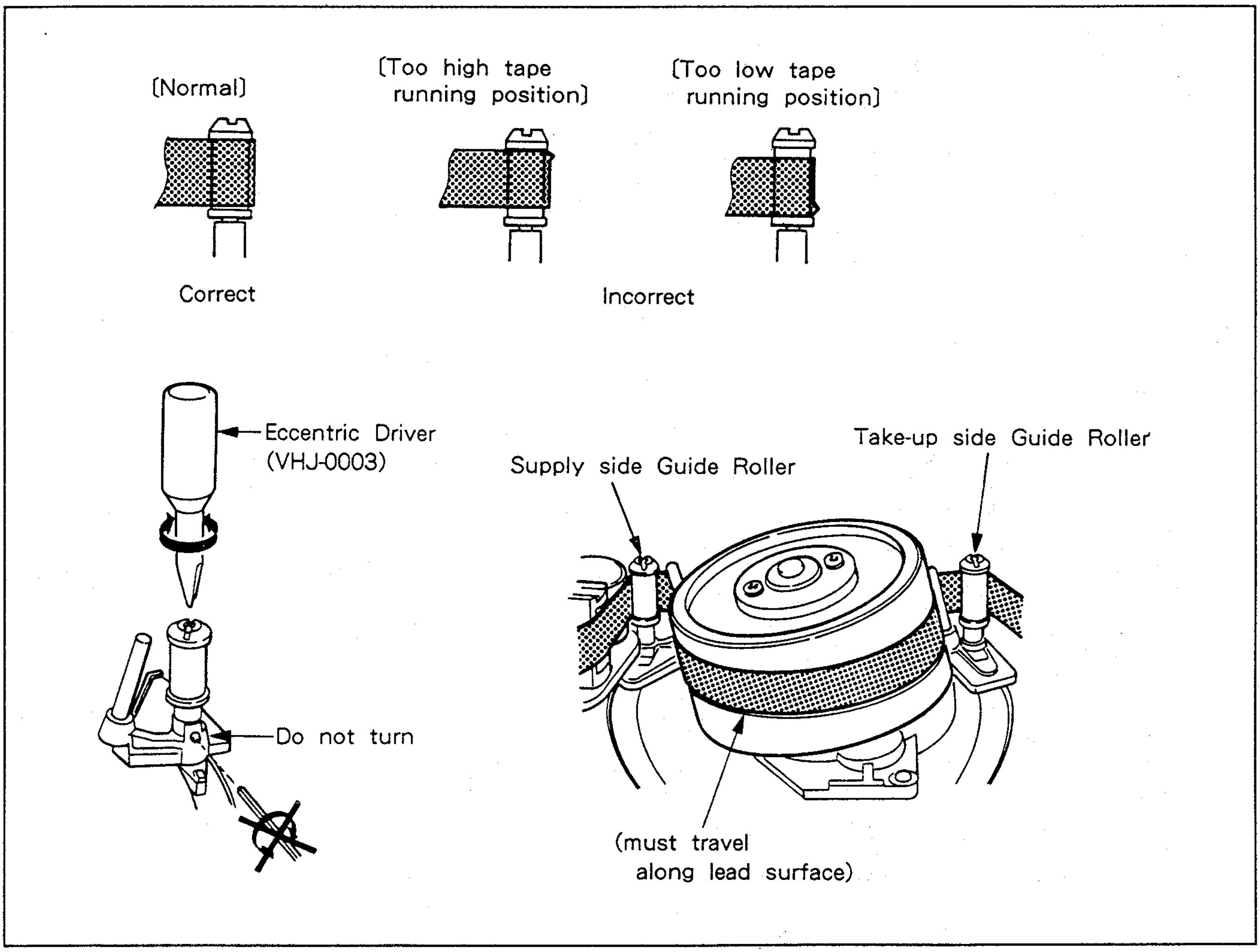

〔Normal〕
〔Too high tape running position〕
〔Too low tape running position〕
Correct
Incorrect
Eccentric Driver (VHJ-0003)
Do not turn
Take-up side Guide Roller
Supply side Guide Roller
(must travel along lead surface)

Fig. 6-4-3. (2) Pre-set for Guide Roller

(3) COMPL Head Bracket (ACE Head) (See Fig. 6-4-4.)
Adjust the special nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL head bracket special nut should be touched.

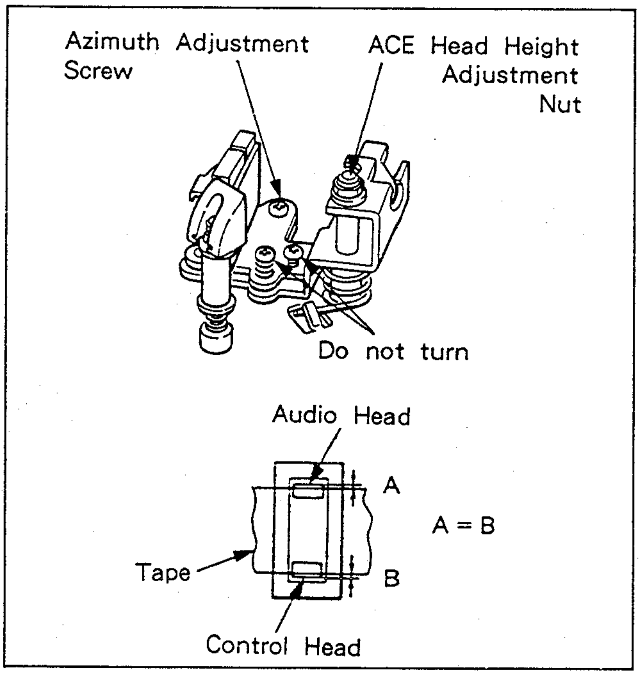
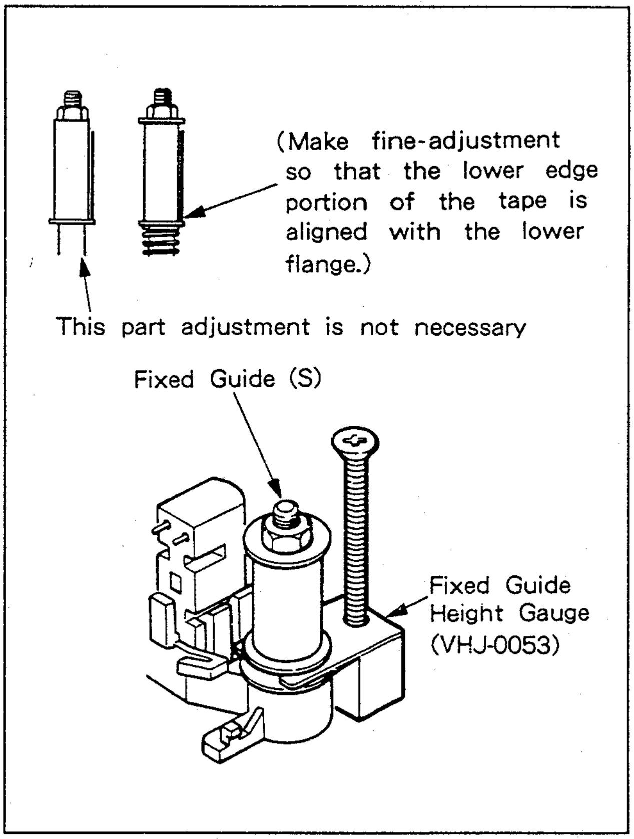


Fig. 6-4-4. (3) Pre-set for Compl Head Bracket

6-4-3. Entrance Side Fixed Guide (S) Height Adjustment (See Fig. 6-4-5.)

The P90 mechanism entrance side fixed guide comes in two types ; the one in this unit is equipped with an upper flange and a spring coil, and it requires height adjustment. The other type is not provided with an upper flange and a spring coil. Height is naturally set when the special nut is fastened, so adjustment is not required.
For units with an upper flange, perform height adjustment as explained below. Even for types which do not require height adjustment, check whether the lower tape edge runs along the lower flange. Be careful not to fasten the special nut excessively, causing the axle to run idle.

1) Rotate the fixed guide (S) counterclockwise to lift the tape somewhat, then insert the fixed guide height gage (VHJ-0053) into the lower side of the fixed guide (S) lower flange.
2) Rotate the fixed guide (S) special nut clockwise a little at a time until the lower flange makes contact with the upper surface of the fixed guide height gage, causing a slight drag.
3) After rotating the special nut 90° counterclockwise, remove the Axed guide height gauge.
4) After adjusting the guide rollers in section 5-4-4, play back the alignment tape (VHJ-0009). Confirm that the tape lower edge runs in close contact with the fixed guide (S) lower flange. In case too much pressure has left a gap between the tape and the lower flange, or excessive lifting has caused curling of the tape lower edge, perform fine adjustment. However, do not adjust the special nut beyond 90° clockwise and 45° counterclockwise.


(Make fine-adjustment so that the lower edge portion of the tape is aligned with the lower flange.)

This part adjustment is not necessary

Fig. 6-4-5. Entrance Side Fixed Guides

6-4-4. Guide Roller Adjustment (See Fig. 6-4-6.)

1) Play back the alignment tape (VHJ-0009), press the tracking control key and adjust the envelope waveform to the maximum level.
2) Loosen the entrance and exit guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until they are fastened and a flat video output waveform is obtained.
3) Confirm that the envelope waveform is not deformed, and check visually that no curling occurs at the guide roller upper and lower flanges.
4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will not, showing valleys or peaks at the first half (entrance) or second half (exit), if the guide roller pressure is excessive or insufficient.
In case there is unevenness in the first half (entrance), adjust the entrance side guide roller. If the second half (exit) shows trouble, adjust finely the exit side guide roller.

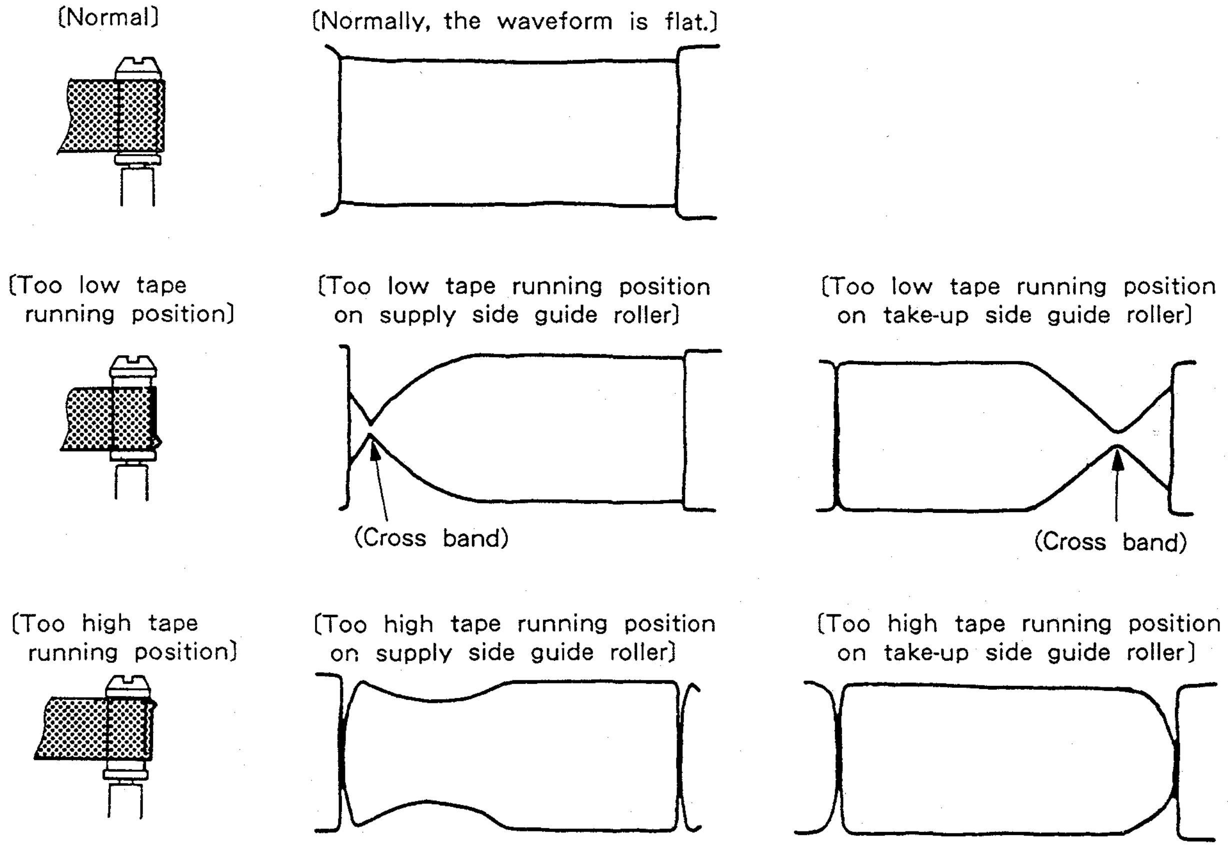
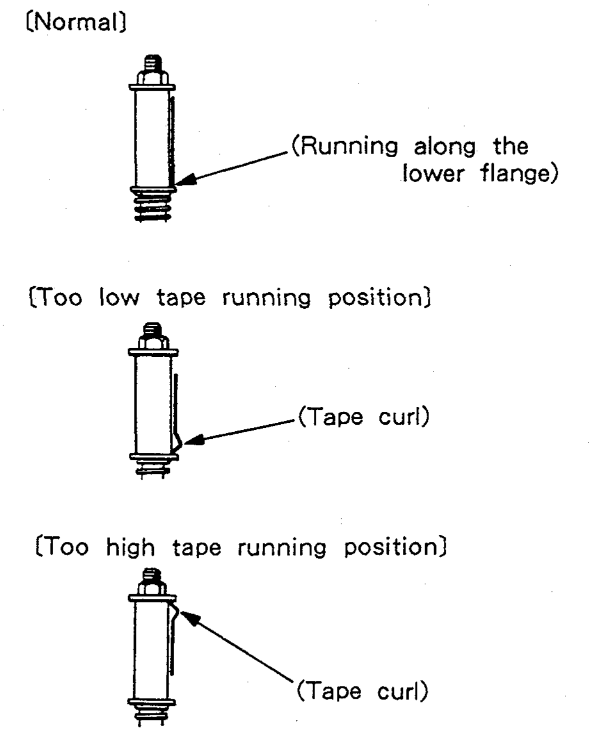

〔Normal〕
〔Normally, the waveform is flat.〕
〔Too low tape running position〕
〔Too low tape running position on supply side guide roller〕
〔Too low tape running position on take-up side guide roller〕
(Cross band)
(Cross band)
〔Too high tape running position〕
〔Too high tape running position on supply side guide roller〕
〔Too high tape running position on take-up side guide roller〕

Fig. 6-4-6. Guide Roller Adjustment

6-4-5. Exit Side Fixed Guide (T) Adjustment (See Fig. 6-4-7.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Rotate the special nut counterclockwise so that the lower flange lifts the tape until its lower edge is slightly curled.
3) Rotate the special nut clockwise a little at a time until curling of the tape lower edge is removed.
4) Confirm at each mode (PLAY, F.SEARCH, R. SEARCH, F.F and REW) that the tape runs along the lower flange and that no curling occurs.



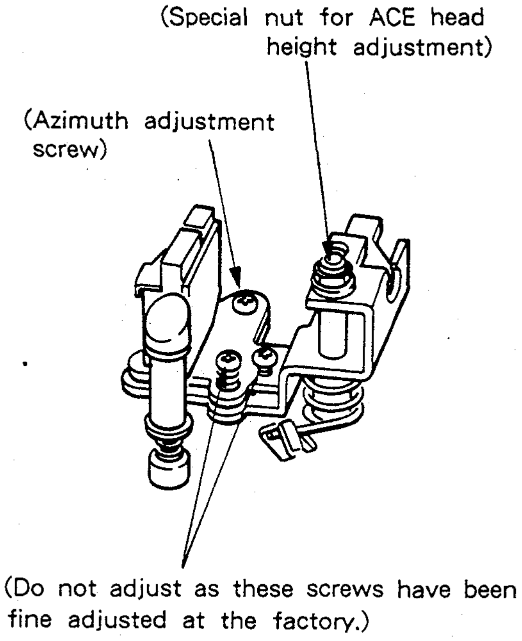
[Normal]
(Running along the lower flange)
[Too low tape running position]
(Tape curl)
[Too high tape running position]
(Tape curl)

Fig. 6-4-7. **Fixed Guide (T)**

6-4-6. COMPL Head Bracket (ACE Head) Adjustment

(1) Height Adjustment and Azimuth Adjustment (See Fig. 6-4-8.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Monitor the audio output waveform with the oscilloscope.
3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
6) Confirm that the audio output waveform amplitude does not fluctuate.



(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Do not adjust as these screws have been fine adjusted at the factory.)

Fig. 6-4-8. **Compl Head Bracket**

(2) Tracking (X Value) Adjustment (See Fig. 6-4-9.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.

2) Set tracking to the center position with the tracking control key (See Note below).

3) Rotate the stopper bracket fixing screw 180° counterclockwise.

4) Monitor the video head output envelope waveform with the oscilloscope.

5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center and the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the plus (+) and minus (−) tracking control keys.

6) Tighten the fixing screw.

7) (Model for LP mode tape speed capability)
Playback the alignment tape (VHJ-0052) and set the tracking to the center using a tracking control key.
Then confirm that the playback picture on screen is normal. If not, Make readjustment by referring to items 1) through 7). To readjust, playback VHJ-0009 and finely adjust the position of the stopper bracket within the range in which the amplitude of the envelope waveform can be held to a maximum.

8) Perform servo circuit PB PHASE (Switching position) adjustment.

Note : For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking keys (+, −) and observe the front panel clock display. It will read "T − : −" at the tracking center, "T − : , T − − : " when keeping the minus (−) key pressed, and "T : −, T : − −" when keeping the plus (+) key pressed. The time indication will be restored 2 to 3 seconds after the tracking keys are released.

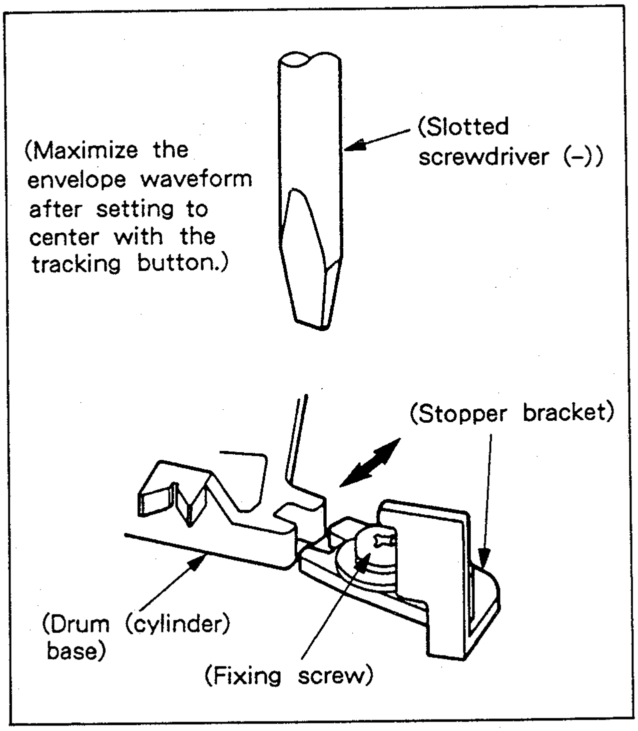

(Maximize the envelope waveform after setting to center with the tracking button.)
(Slotted screwdriver (−))
(Stopper bracket)
(Drum (cylinder) base)
(Fixing screw)

Fig. 6-4-9

6-4-7. Checking after Adjustment

Tape running may show a slight change depending upon the type of the cassette tape (thick or thin tape), the start, middle, or end of cassette tape winding, etc. After performing the tape path adjustment with use of an alignment tape, be sure to check the following points. Incidentally, the alignment tape to be used should be E-180 or E-240 cassette should be a good one without any damage to it.

(1) Try to play back the alignment tape (VHJ-0009) and confirm that the envelope waveform rise immediately and that there is no fluctuation in the envelope waveform and the audio output waveform.

(2) Load a cassette tape E-180 and start recording operation in the standard mode. 1 kHz should be fed to the audio input terminal when recording. After recording, the following points should be checked.

1. When the recorded portion is played back, the envelope waveform rise immediately, and no fluctuation in the envelope waveform is observed. Also, no speed drop occurs during the first half period or the last half period. Further, check to be sure that no fluctuation occurs in the audio waveform. Also confirm that neither the tape curling or derailing is caused on the upper or lower flange and the on the read side of the drum.
2. Confirm that no tape curling or derailing occurs in the upper or lower flange of each tape guide and the read side of the drum during each mode of operation, namely, FF, REW, F. SEARCH, and R. SEARCH.
3. Confirm that the envelope waveform rise immediately after changing the mode directly to the PLAY from each mode of FF, REW, F. SEARCH, R. SEARCH, or POWER OFF (INITIAL) and that no tape curling or derailing occurs in the upper or lower flange of the each tape guide and on the read side of the drum.

(3) Load a E-240 cassette tape and perform recording operation in the SP mode. 1 kHz should be fed to the audic input terminal when recording. Now, confirm that the envelope waveform rise immediately upon starting the playback of the recorded portion, and that neither fluctuation in the envelope waveform nor a speed drop occurs during the first half period or the last half period. Also confirm that no tape curling or derailing is caused in the upper or lower flange of each tape guide and on the drum lead surface.

(4) Perform recording for 60 seconds in the SP mode at the start of E-240 cassette winding. Play back the recorded portion and repeat the F.SEARCH ↔ R.SEARCH ten times, following which confirm that no damage is done to the tape edge. If any damage is found on the tape edge, a proper step must be taken as below depending upon the symptom obserbed.

1. When a sawtooth shaped damage is caused on underside of the tape edge by the REV guide
   1) Check to see if damage is done to the tape by the REV guide.
   2) Loosen the tilt adjustment screw of the ACE head bracket by turning it 135° counterclockwise.
   3) Make readjustment of the exit side fixing guide by referring to item 6-4-5.
   4) Make readjustment of the ACE head bracket (azimuth, height and adjustment of X value) by referring to item 6-4-6.
   5) Confirm that no fluctuation in the audio level is caused by loosening the tilt adjustment screw in steps 1) and 2) above. Move the screw a little back if any fluctuation is found (but never move it back to the original position). After adjusting the tilt adjustment screw is readjusted, perform steps 3) and 4) once again.
   6) Confirm again that the E-240 cassette tape does not sustain any damage.
   7) Perform the recording and playback on the E-180 and E-240 cassette tape and confirm that no fluctuation occurs in the envelope waveform and the audio waveform.

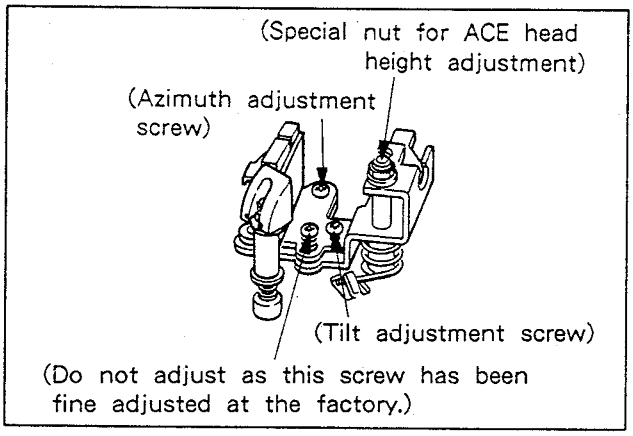

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Tilt adjustment screw)
(Do not adjust as this screw has been fine adjusted at the factory.)

Fig. 6-4-10 Compl Head Bracket

2. If damage in the form of a sawtooth or a streak is found on the tape edge
   1) Check if a large amount of magnetic particles is adhered to the exit-side guide roller. If magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced.
   2) Confirm if the tape is held too tightly by the exit-side guide roller, or if the last half of the envelope waveform is flat. If the type is found held too tightly, readjustment should be made by referring to 6-4-4.
   3) Recheck if the damage is still caused on the E-240 tape.
      If similar damage is still found on the tape, the exit-side guide roller should be loosened about 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the exit-side guide roller. To do this, record and play back the E-240 cassette tape.

(5) Perform recording for 60 seconds in the SP mode at the near end of the E-240 cassette tape. Play back the recorded portion and repeat the F. SEARCH ↔ R. SEARCH ten times, following which a check should be made to see if damage is still done to the tape edge. If a damage in the form of a sawtooth or a streak is still occurred on the tape edge by the upper lounge of entrance side guide roller, proceed with the step given below.
   1) Check if a large amount of magnetic particles is adhered to the entrance-side guide roller. If the magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced with new one.
   2) Confirm if the tape is held too tightly by the entrance-side guide roller, or if the first half of the envelope waveform is flat. If the tape is found held too tightly, readjustment should be made by referring to 6-4-4.
   3) Recheck if the damage is still caused on the E-240 tape.
      If the damage is still found on the tape, the entrance-sideguide roller should be loosened aboud 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelop waveform or the audio waveform by looseving the entrance-side guide roller. To do this, record and play back the E-240 cassette tape.

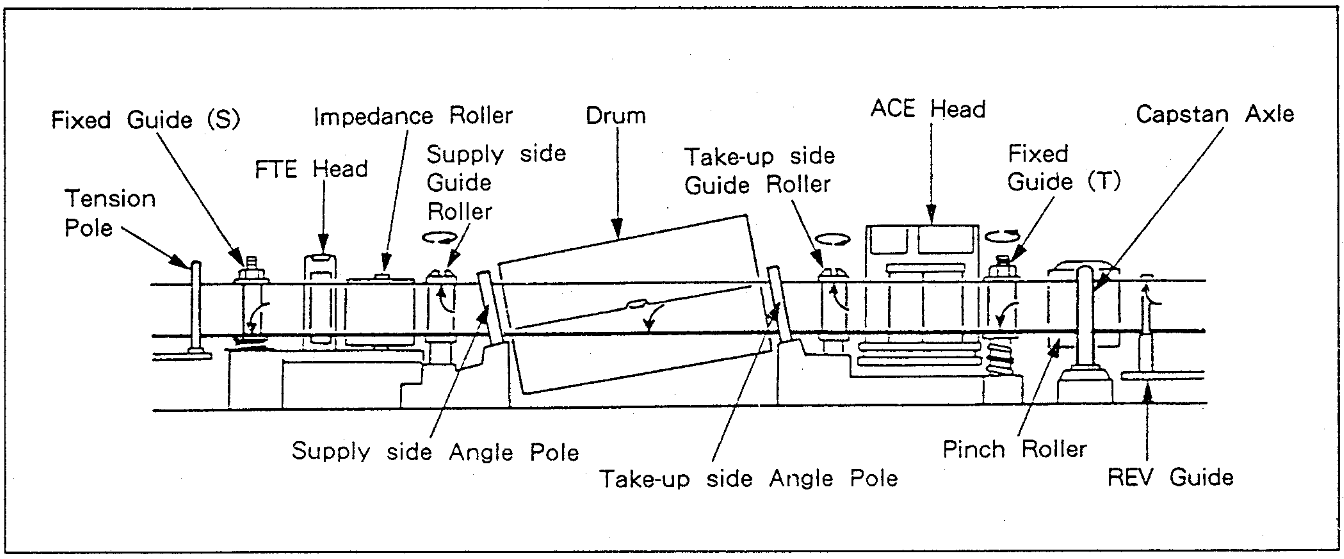


Fig. 6-4-11.

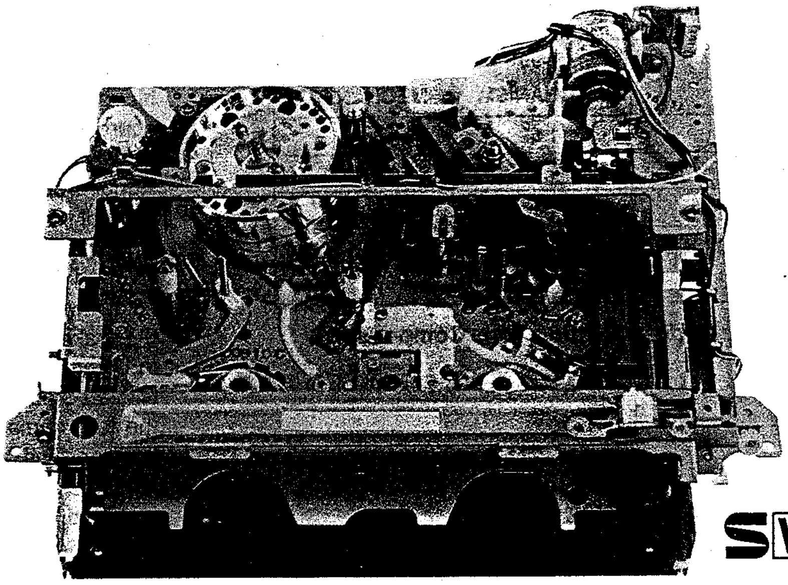
MEMO

SUPPLEMENT
SERVICE TECHNICAL INFORMATION

FISHER

P-90 S VHS MECHANISM

Video Cassette Recorder



S VHS 625 VHS PAL

Use this supplement together with the P-90 Mechanism Manual (WM-530598) of the Service Technical Information published in 1990.

CONTENTS

1. Outline of P-90 S VHS Mechanism 2
2. Sections Changed from P-90 Mechanism Issued in 1990 4
    - 2-2. Description of Mechanism Drive 4
    - 5-1. Mechanism Main Unit 6
    - 5-2. Cassette Holder Mechanism 7
    - 5-10. Fixed Guide, FE Head Lever Ass'y 10

1 / WM530823 /
HL10F3-1 / SERVICE MANUAL / 0857364

SANYO FISHER

REFERENCE No. WM-530823

1. OUTLINE OF P-90 S VHS MECHANISM

The reel drive system of P-90 S VHS mechanism has been newly developed based upon the P-90 mechanism. As for the mechanism composition other than reel drive system is the same as P-90 mechanism. Since only the different sections from P-90 mechanism are described in this manual, use the P-90 Mechanism Manual (Mechanism Service Technical Information) published in 1990 as well. P-90 S VHS is featured as follows;

1) Brass impedance rollers of large diameter at head drum entrance and small diameter at exit are employed in order to reduce jitter component of tape path system and to obtain the stable picture.

2) The mode transition time as shown in Fig. 1-1 is reduced, comparing with P-90 mechanism. The tape rewind time is largely reduced by FF/REW high-speed. Therefore, the following points are taken into consideration in P-90 S VHS.

	P-90 MECHANISM	P-90 S VHS MECHANISM
STOP → PLAY	1.5"	1.3"
CASSETTE IN	4.9"	4.4"
POWER OFF → PLAY	4.1"	3.6"
FF/REW REWIND TIME (E-180)	4'	2'40"

Table 1-1. Mode Transition Time Comparison

① Noise reduction by large driven gear
In order to reduce the noise of reel drive system in FF/REW modes, the large driven gear is employed so that proper contact ratio is obtained. A driving force between gears can be smoothly transmitted by using large gear, therefore the noise at gear engagement can be reduced.

② Change of deceleration ratio in FF/REW modes
In order to reduce the capstan motor noise, the reel pulley diameter has been changed and drive deceleration ratio is reduced as possible.

③ Brake mechanism improvement
During taking-up the tape at high-speed in FF/REW modes, if sudden brake is applied, a high tape tension is generated and the tape will be damaged by rotary head, etc. Therefore, the brake mechanism components have been improved to apply brake softly, so that the brake operation is stabilized.

④ Capstan motor control
In order to operate FF and REW modes in higher-speed, a capstan motor used as a reel driving source is newly developed to upgrade the revolutions. However, only by upgrading the revolutions, VISS signal dropout, etc. caused by tape defects and slacks can not be prevented.
And when the tape is rewound in high-speed even at the end of tape rewinding, the leader tape portion is also rewound before the tape end sensor detects and the brake is applied, thus the tape will be damaged.
In order to prevent this, the capstan motor is designed to start smoothly at the start of FF/REW modes. And the tape remaining amount detector is used to detect the specified amount (E-60:2 mm, E-180:3.6 mm) at high-speed rewind, and as soon as it reaches the specified amount, the capstan motor deceleration starts. Also in decelerating mode, a smooth deceleration is performed not to cause any tape slacks. (Refer to 1-1.)

⑤ In order to prevent the noise caused by operating at high-speed in FF/REW modes, the guide roller at drum entrance is renewed .

3) A detection switch to enable automatic discrimination of S VHS cassette tape is added.
(Same type as conventional S VHS model)

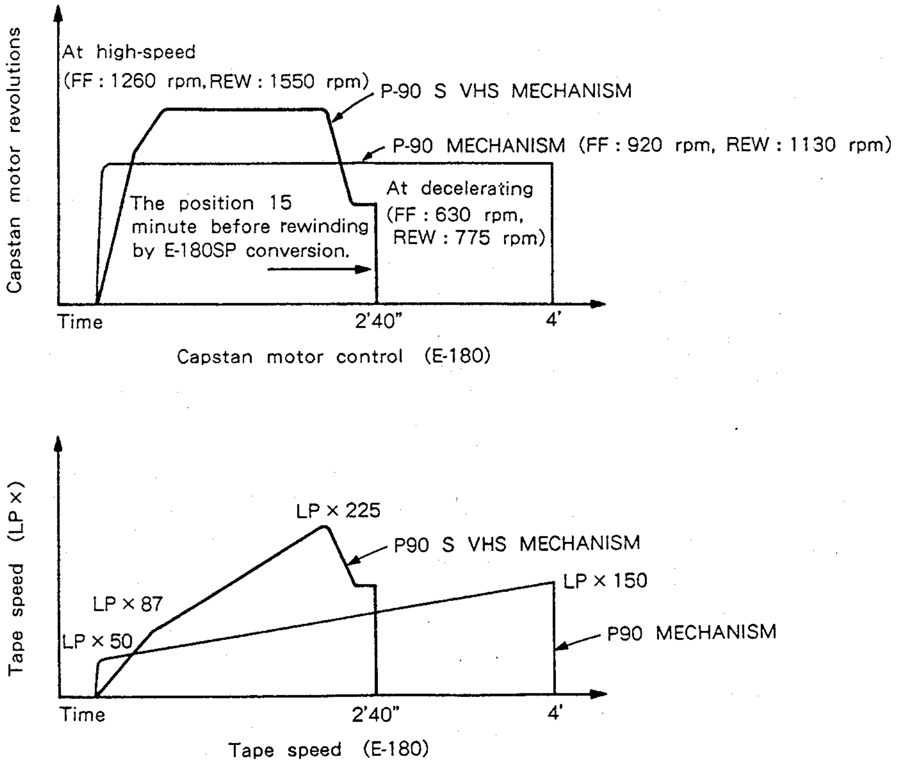


Fig. 1-1. Comparison of Conventional Mechanism and P-90 S VHS Mechanism

2. SECTIONS CHANGED FROM P90 MECHANISM ISSUED IN 1990

2-2. DESCRIPTION OF MECHANISM DRIVE

The shaded sections are different from P-90 MECHANISM.

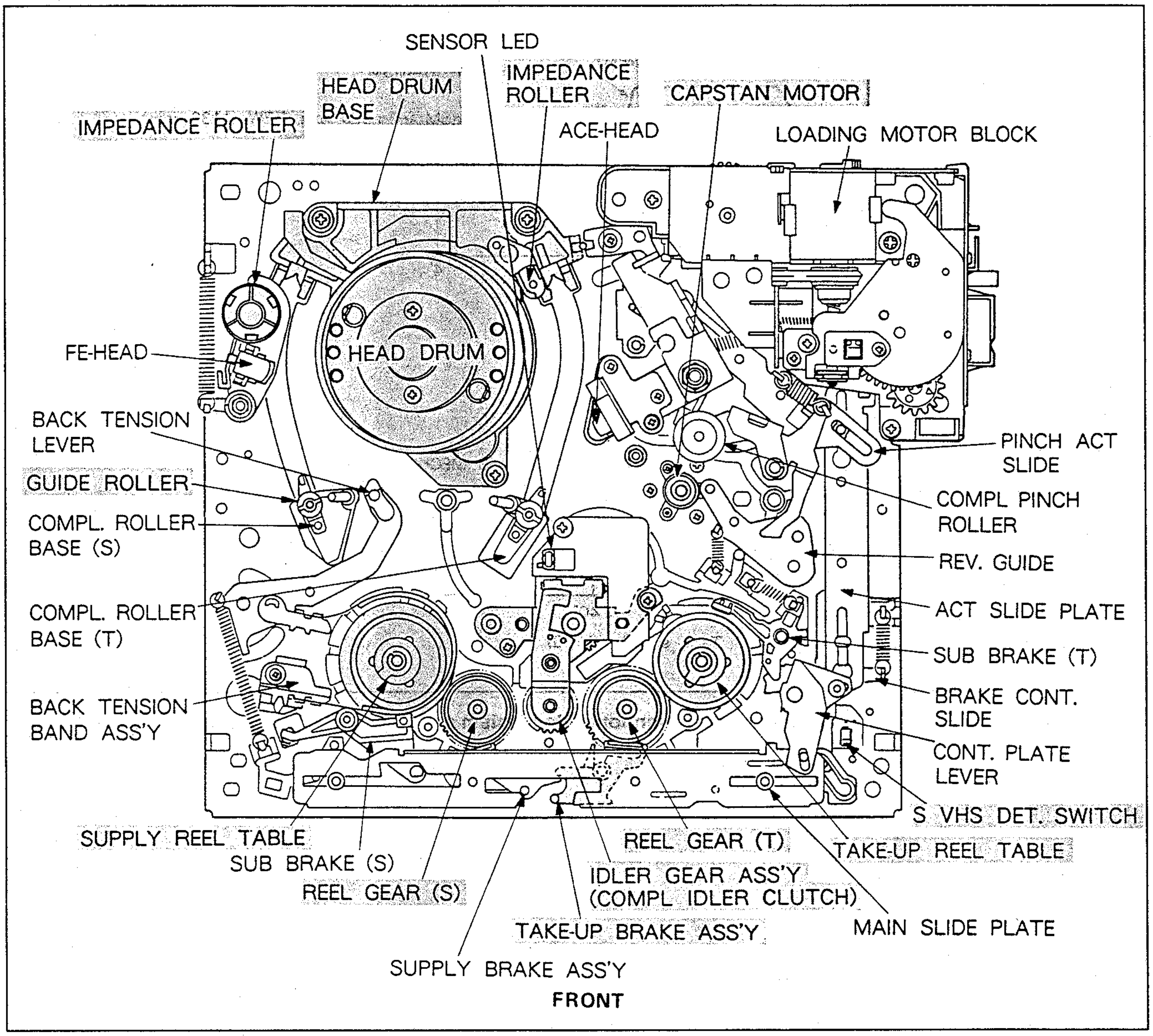

SENSOR LED
HEAD DRUM BASE
IMPEDANCE ROLLER
CAPSTAN MOTOR
IMPEDANCE ROLLER
ACE-HEAD
LOADING MOTOR BLOCK
HEAD DRUM
FE-HEAD
BACK TENSION LEVER
GUIDE ROLLER
COMPL. ROLLER BASE (S)
COMPL. ROLLER BASE (T)
BACK TENSION BAND ASS'Y
PINCH ACT SLIDE
COMPL PINCH ROLLER
REV. GUIDE
ACT SLIDE PLATE
SUB BRAKE (T)
BRAKE CONT. SLIDE
CONT. PLATE LEVER
S VHS DET. SWITCH
SUPPLY REEL TABLE
SUB BRAKE (S)
REEL GEAR (S)
REEL GEAR (T)
TAKE-UP REEL TABLE
IDLER GEAR ASS'Y (COMPL IDLER CLUTCH)
TAKE-UP BRAKE ASS'Y
MAIN SLIDE PLATE
SUPPLY BRAKE ASS'Y
FRONT

Fig. 2-1. TOP VIEW OF MECHANISM (INITIAL MODE)

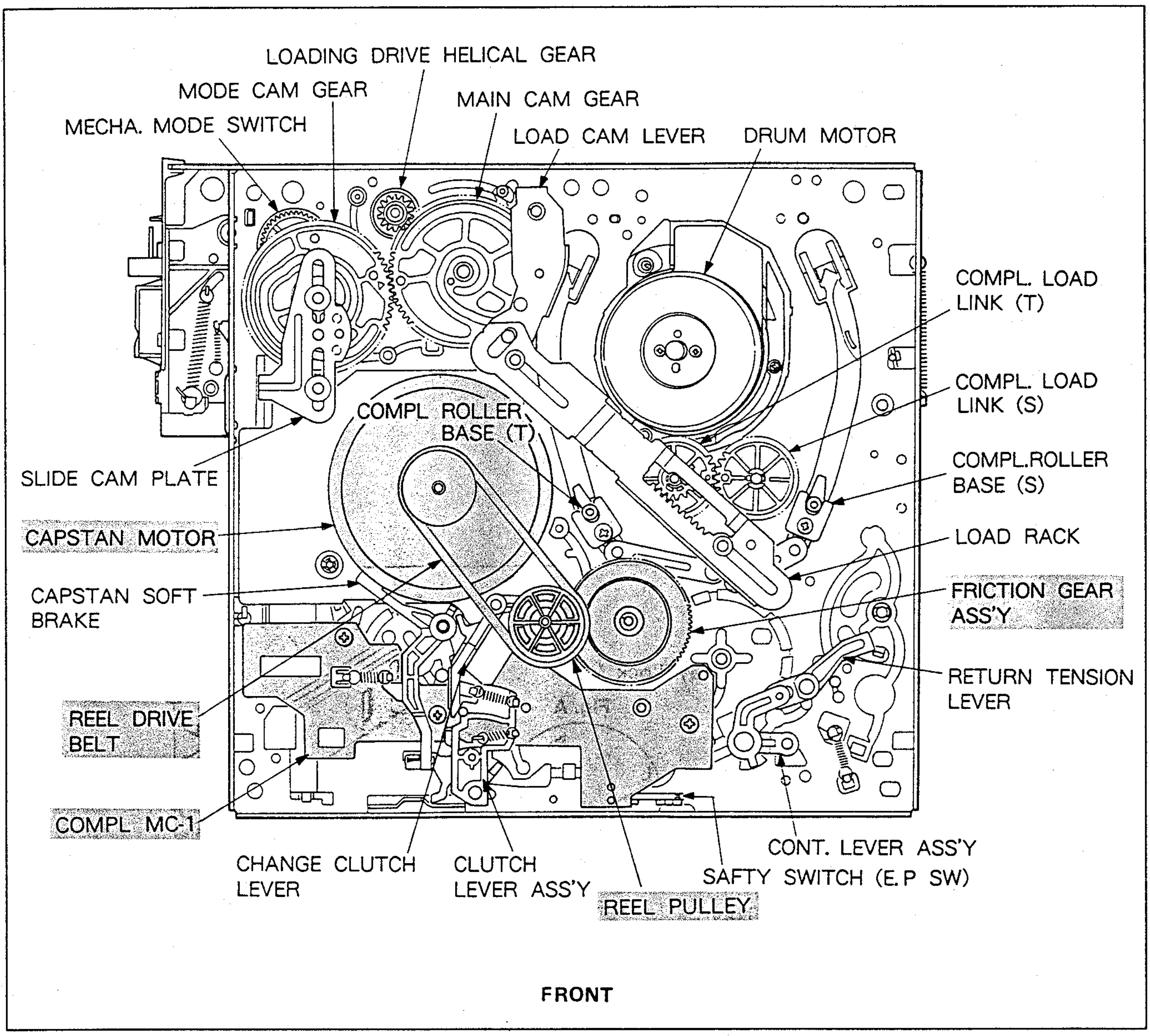

LOADING DRIVE HELICAL GEAR
MODE CAM GEAR
MAIN CAM GEAR
MECHA. MODE SWITCH
LOAD CAM LEVER
DRUM MOTOR
COMPL. LOAD LINK (T)
COMPL. LOAD LINK (S)
COMPL ROLLER BASE (T)
COMPL.ROLLER BASE (S)
SLIDE CAM PLATE
LOAD RACK
CAPSTAN MOTOR
FRICTION GEAR ASS'Y
CAPSTAN SOFT BRAKE
RETURN TENSION LEVER
REEL DRIVE BELT
COMPL MC-1
CONT. LEVER ASS'Y
CHANGE CLUTCH LEVER
CLUTCH LEVER ASS'Y
SAFTY SWITCH (E.P SW)
REEL PULLEY
FRONT

Fig. 2-2. BOTTOM VIEW OF MECHANISM (INITIAL MODE)

5-1. MECHANISM MAIN UNIT (See Fig. 5-1-1.)

1. Removal

1) Remove the connectors of the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible cable ① connecting the COMPL CYLINDER to the PRE-AMP UNIT ③ (See Fig. A).
3) Remove the two screws ②, then remove the PRE-AMP UNIT ③.
4) Remove the screw ④, then remove the PRE-AMP. BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the screw ⑦, two screws ⑪ and two screws ⑩.
   Then lift up the mechanism main unit and remove it. Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws. (See Fig. B)

Note: Shape of the PRE-AMP UNIT ③ and the PRE-AMP. BRACKET ⑤ differ depending on the model.

2. Remounting

1) Mount the mechanism main unit onto the chassis with the screw ⑦, two screws ⑪ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP. BRACKET ⑤ with the two screws ④.
4) Mount the PRE-AMP UNIT ③ and the ground lug with the two screws ② (some models are not provided with a ground lug).
5) Insert the flexible cable ① into the connector of the PRE-AMP UNIT.
6) Connect the connectors of COMPL MC-3 and COMPL HEAD BRACKET.

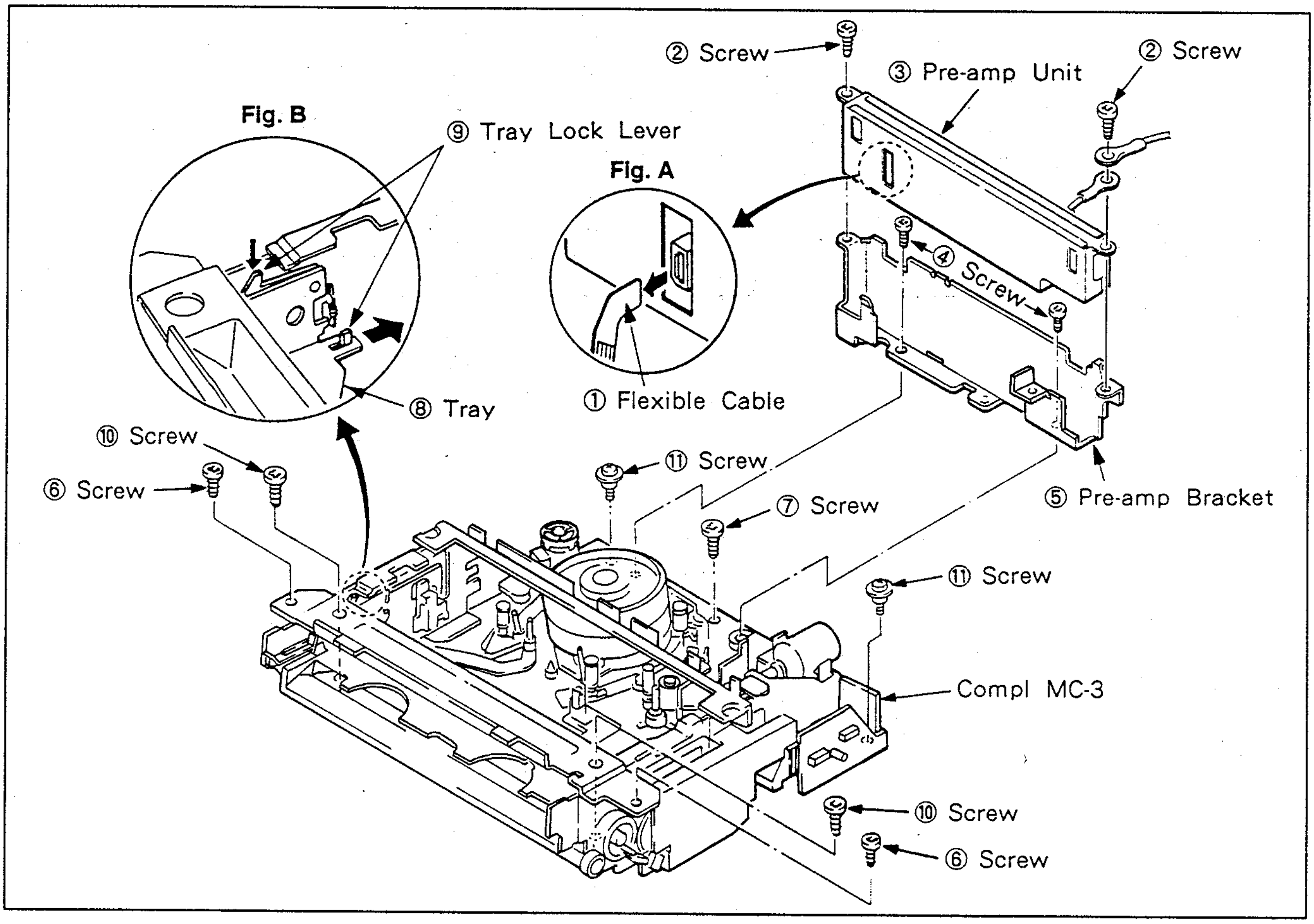

② Screw
③ Pre-amp Unit
② Screw
Fig. B
⑨ Tray Lock Lever
Fig. A
④ Screw
⑧ Tray
① Flexible Cable
⑩ Screw
⑥ Screw
⑪ Screw
⑦ Screw
⑤ Pre-amp Bracket
⑪ Screw
Compl MC-3
⑩ Screw
⑥ Screw

Fig. 5-1-1. Mechanism Main Unit

5-2. CASSETTE HOLDER MECHANISM

5-2-1. COMPL Cassette Mechanism (See Fig. 5-2-1.)

1. Removal

1) Set the video main unit to the EJECT completed mode.
2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from CASSETTE HOLDER.
3) Remove the two screws ①.
4) Remove the two screws ②.
5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front (See Fig. B). When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from above, match the front loading gear hole ⑤ with the MOTOR HOLDER hole ⑥ as shown in Fig. A).
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
   Match positions of the FRONT LOADING GEAR △ mark ⑦ and the RACK EJECT mark ⑧.
   (See Fig. A.)
4) Fix to the mechanism chassis with the two screws ②.
5) Fix to the chassis with the screw ①.
6) Connect to the various connectors.

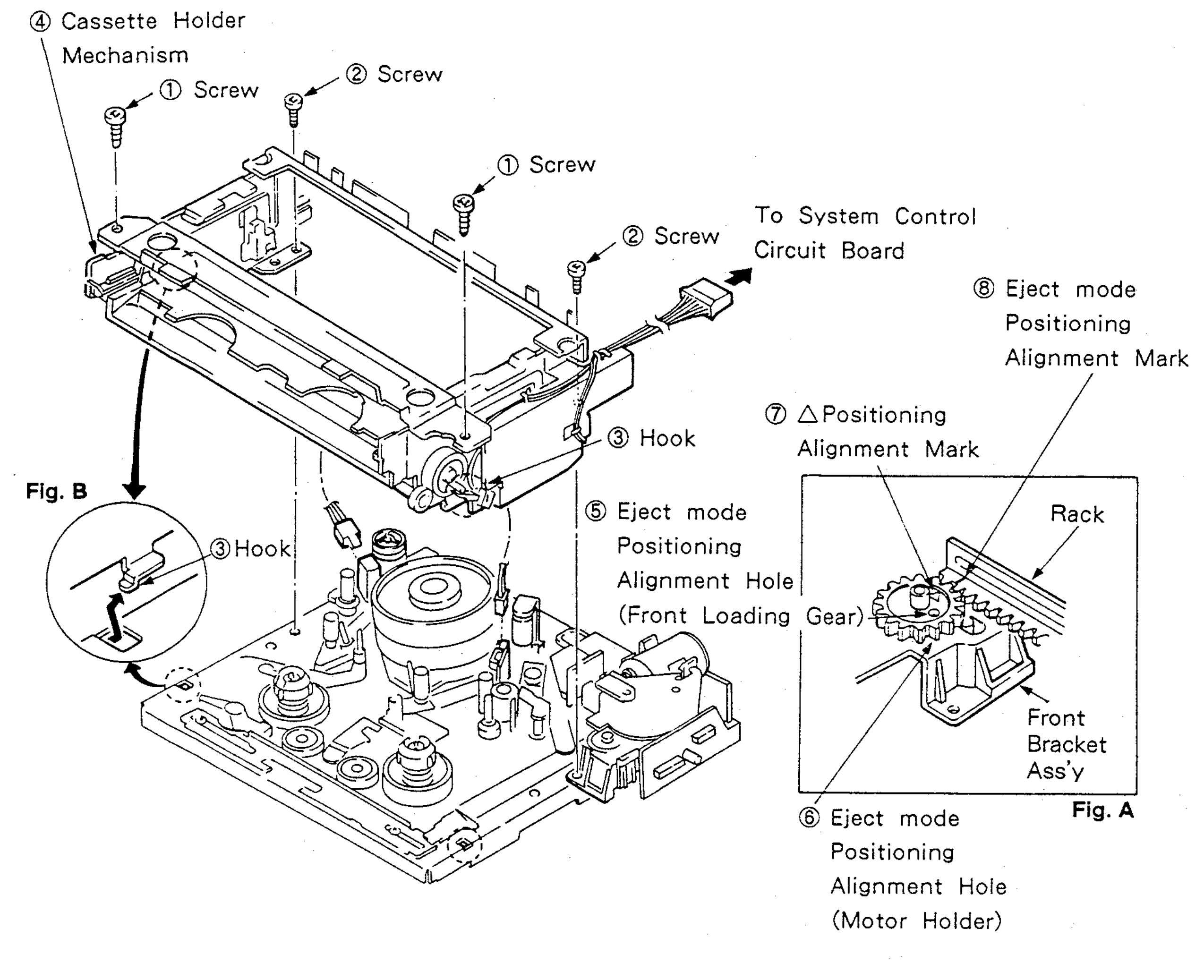

④ Cassette Holder Mechanism
① Screw
② Screw
① Screw
② Screw
To System Control Circuit Board
⑧ Eject mode Positioning Alignment Mark
⑦ △Positioning Alignment Mark
③ Hook
Fig. B
③Hook
⑤ Eject mode Positioning Alignment Hole (Front Loading Gear)
Rack
Front Bracket Ass'y
⑥ Eject mode Positioning Alignment Hole (Motor Holder)
Fig. A

Fig. 5-2-1. Compl Cassette Mechanism

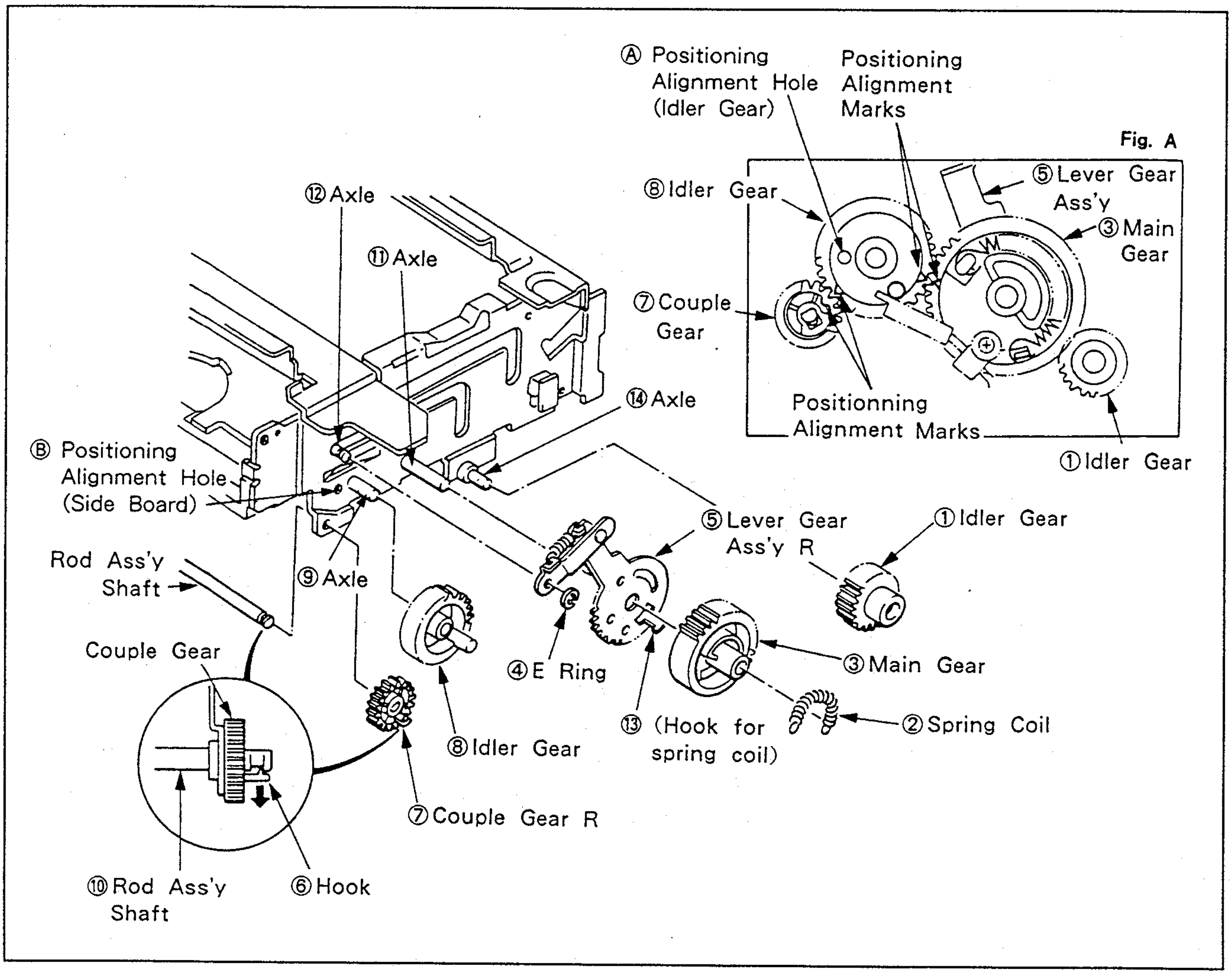
5-2-3. Cassette Drive Gear (Right) (See Fig. 5-2-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in 5-2-1. and 5-2-2., respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.
5) Open the hook ⑥ and remove the COUPLE GEAR R ⑦. Take care not to open the hook ⑥ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the IDLER GEAR R ⑧.

2. Remounting

1) Apply grease to gear parts that undergo friction.
2) Mount the IDLER GEAR R ⑧ onto the axle ⑨.
3) Mount the COUPLE GEAR R ⑦ onto the ROD ASS'Y axle ⑩. When doing so, match the couple gear position with the IDLER GEAR R ⑧ as shown in Fig. A.
4) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Match position to the IDLER GEAR R ⑧ as shown in Fig. A.
5) Mount the E ring ④ onto the axle ⑫.
6) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, match position to the IDLER GEAR R ⑧ as shown in Fig. A.
7) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR R ③ and the LEVER GEAR ASS'Y R.
8) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, match position to the MAIN GEAR as shown in Fig. A.
9) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM ASS'Y as instructed in 5-2-2. and 5-2-1., respectively.



Ⓐ Positioning Alignment Hole (Idler Gear)
Positioning Alignment Marks
Fig. A
⑧ Idler Gear
⑤ Lever Gear Ass'y
③ Main Gear
⑦ Couple Gear
⑭ Axle
Positionning Alignment Marks
① Idler Gear
⑫ Axle
⑪ Axle
Ⓑ Positioning Alignment Hole (Side Board)
Rod Ass'y Shaft
⑨ Axle
Couple Gear
⑤ Lever Gear Ass'y R
① Idler Gear
④ E Ring
③ Main Gear
⑧ Idler Gear
⑬ (Hook for spring coil)
② Spring Coil
⑦ Couple Gear R
⑩ Rod Ass'y Shaft
⑥ Hook

Fig. 5-2-3. Cassette Drive Gears (Right Side)

5-2-4. Cassette Drive Gear (Left) (See Fig. 5-2-4)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 5-2-1.
2) Remove the COUPLE GEAR R as instructed in 5-2-3.
3) Remove the ROD ASS'Y ①.
4) Remove the E ring ②.
5) Remove the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
6) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y ④.
7) Remove the IDLER GEAR L ⑥ and the DOOR OPEN LEVER ⑦.

2. Remounting

1) Apply grease to the axles ⑧, ⑨ and ⑩.
2) Apply grease to the IDLER GEAR L ⑥.
3) Mount the DOOR OPEN LEVER ⑦ onto the axle ⑧. Do it so that the end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.
   CASSETTE DOOR ⑪ is built in the front cabinet.
4) Mount the IDLER GEAR L ⑥ onto the axle ⑧.
5) Pass the ROD ASS'Y ① through the hole ⑫. Match position of the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
6) Mount the COUPLE GEAR R as instructed in 5-2-3.
7) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
8) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Match position to the IDLER GEAR L ⑥ as shown in Fig. B.
9) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in 5-2-1.

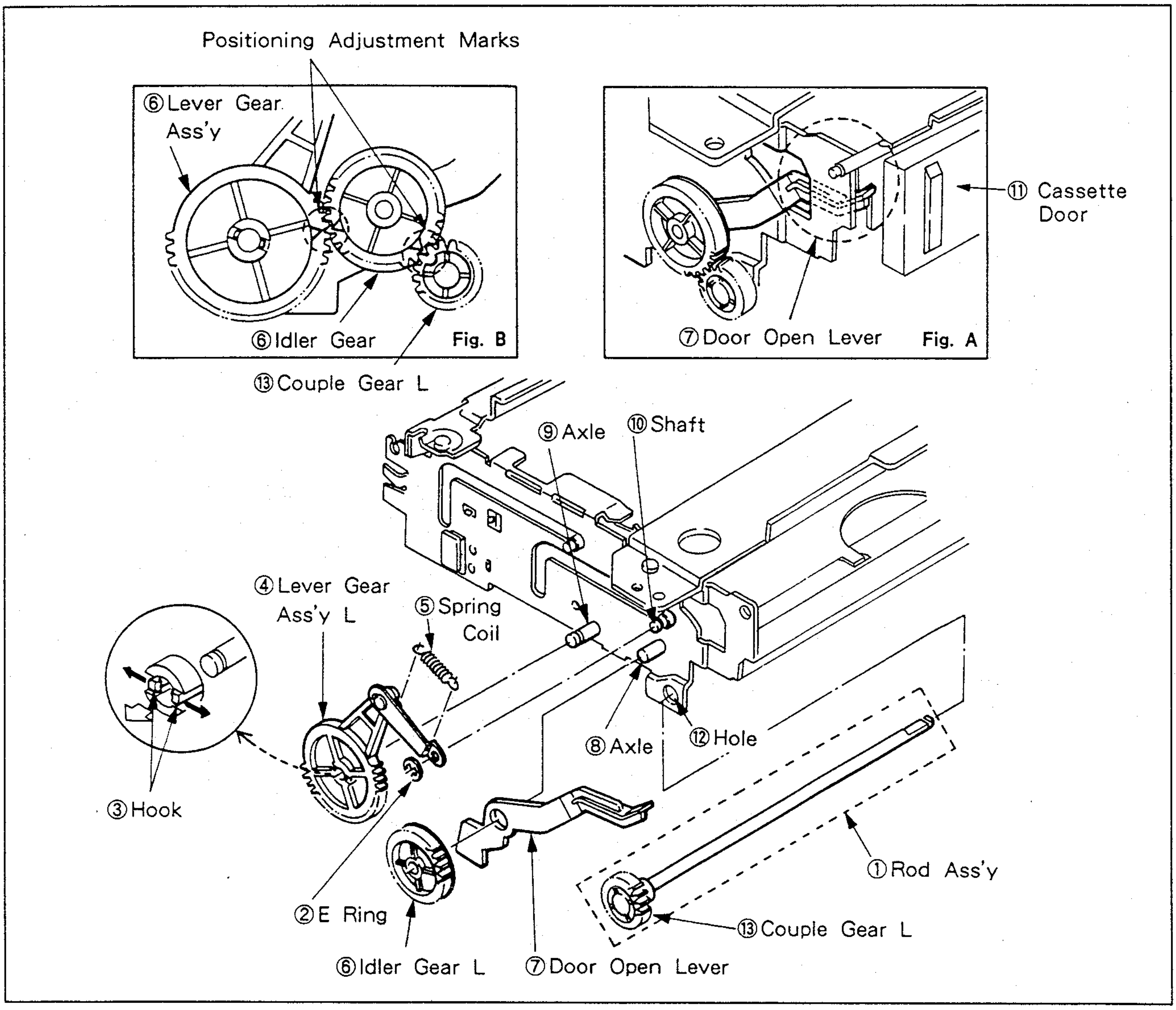

Positioning Adjustment Marks
⑥Lever Gear Ass'y
⑥Idler Gear
Fig. B
⑬Couple Gear L
⑪ Cassette Door
⑦Door Open Lever
Fig. A
⑨Axle
⑩Shaft
④Lever Gear Ass'y L
⑤Spring Coil
③Hook
⑧Axle
⑫Hole
①Rod Ass'y
⑬Couple Gear L
②E Ring
⑥Idler Gear L
⑦Door Open Lever

Fig. 5-2-4. Cassette Drive Gears (Left Side)

5-10. FIXED GUIDE, FE HEAD LEVER ASS'Y

5-10-1. Entrance side Fixed Guide, FE Lever Ass'y and Exit side Impedance Roller (See Fig. 5-10-1.)

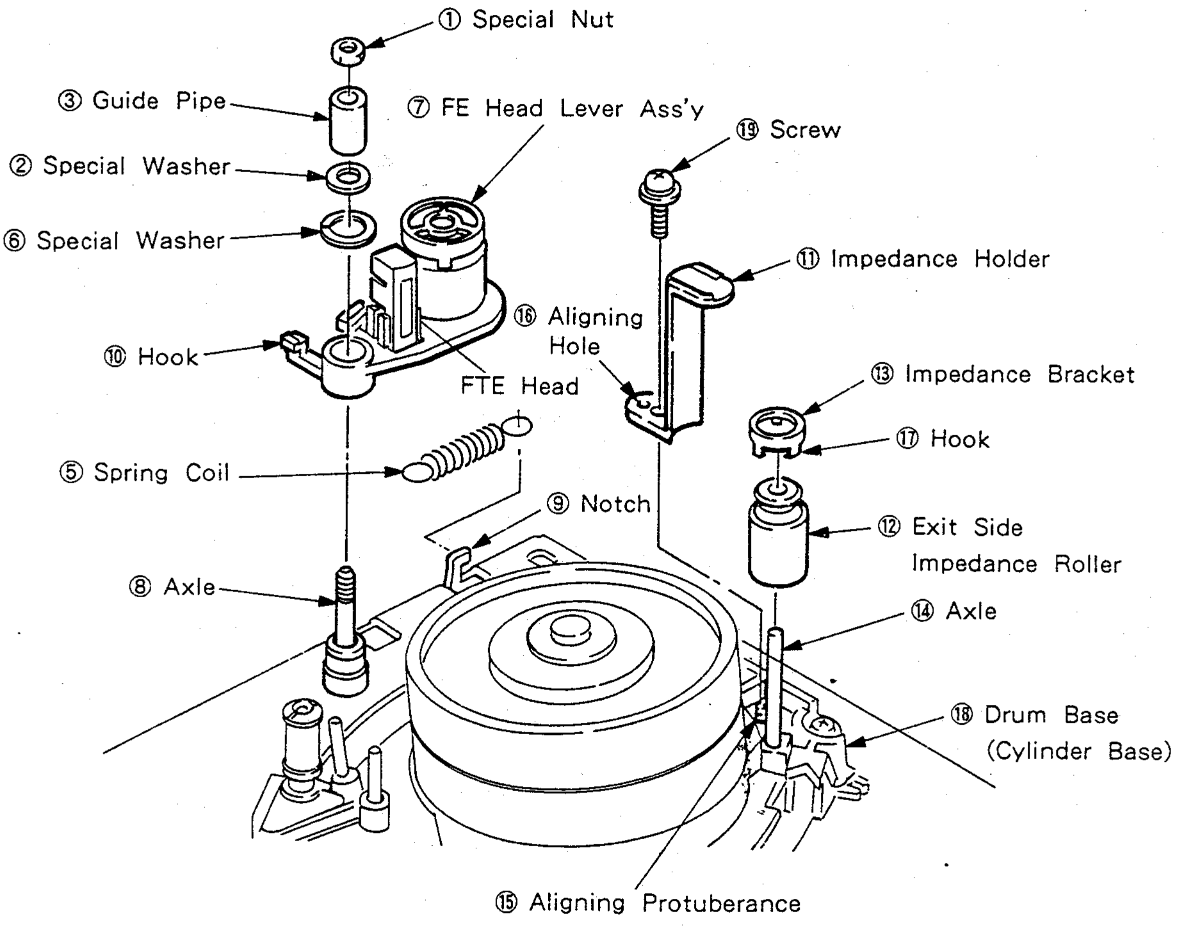
1. Removal

1) Remove the special nut ①, Then remove the GUIDE PIPE ③ and the special washer ②, in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector.
4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.
5) Remove the screw ⑲, IMPEDANCE HOLDER ⑪ and EXIT SIDE IMPEDANCE ROLLER ⑫ with IMPEDANCE BRACKET ⑬.
6) Open the IMPEDANCE BRACKET hook ⑰ a little and remove the EXIT SIDE IMPEDANCE ROLLER ⑫.

Note: When removing and remounting the impedance roller, handle it carefulley to protect it from scratches and dirt.

2. Remounting

1) Mount the IMPEDANCE BRACKET ⑬ onto the EXIT SIDE IMPEDANCE ROLLER ⑫. Confirm that the hook ⑰ is hooked to the EXIT SIDE IMPEDANCE ROLLER ⑫.
2) Mount the EXIT SIDE IMPEDANCE ROLLER ⑫ onto the AXLE ⑭.
3) While aligning the IMPEDANCE HOLDER hole ⑯ with the protuberance ⑮, mount the IMPEDANCE HOLDER ⑪ to the DRUM BASE ⑱ with the screw ⑲.
4) After mounting the FE HEAD LEVER ASS'Y ⑦ onto the AXLE ⑧, mount the special washer ⑥.
5) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE HEAD LEVER ASS'Y hook ⑩.
6) Mount the special washer ②, the GUIDE PIPE ③ and the special nut ① to the AXLE ⑧, in that order.
7) At that time, do not excessively tighten the special nut to avoid idle rotation of the axle ribet. The height of fixing guide on the inlet side is not required.
8) Connect the connector to the FTE HEAD.



① Special Nut
③ Guide Pipe
⑦ FE Head Lever Ass'y
⑲ Screw
② Special Washer
⑥ Special Washer
⑪ Impedance Holder
⑯ Aligning Hole
⑩ Hook
FTE Head
⑬ Impedance Bracket
⑰ Hook
⑤ Spring Coil
⑨ Notch
⑫ Exit Side Impedance Roller
⑧ Axle
⑭ Axle
⑱ Drum Base (Cylinder Base)
⑮ Aligning Protuberance

Fig. 5-10-1. Entrance side Fixed Guide, FE Lever Ass'y and Exit side Impedance Roller

5-10-2. Entrance side Impedance Roller and FTE Head (See Fig. 5-10-2.)

1. Removal

1) Remove the FTE HEAD ① connector.
2) Open the hook ② a little, then remove the IMPEDANCE BRACKET ④.
3) Remove the special washer ⑧, then remove the ENTRANCE SIDE IMPEDANCE ROLLER ③.
4) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note: Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting

1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
2) Mount the ENTRANCE SIDE IMPEDANCE ROLLER ③ onto the AXLE ⑦, then mount the special washer ⑧.
3) Mount the IMPEDANCE BRACKET ④ onto the ENTRANCE SIDE IMPEDANCE ROLLER ③. Confirm that the hook ② is hooked to the ENTRANCE SIDE IMPEDANCE ROLLER ③.
4) Connect the connector to the terminal of the FTE HEAD ①.

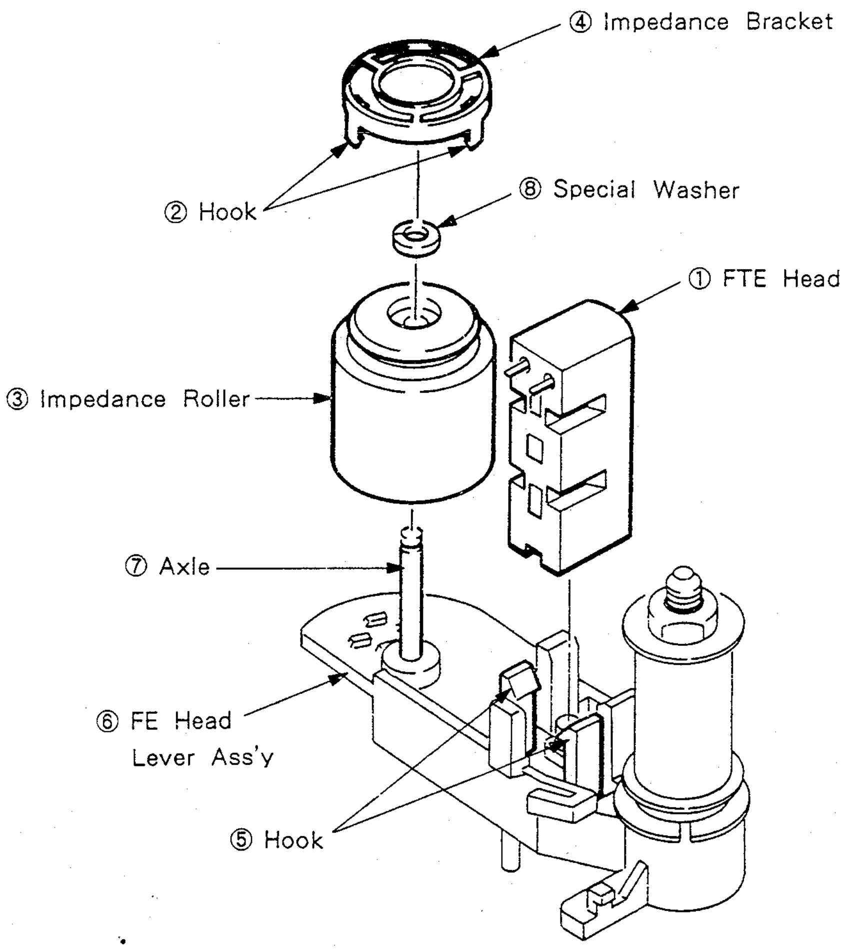

④ Impedance Bracket
② Hook
⑧ Special Washer
① FTE Head
③ Impedance Roller
⑦ Axle
⑥ FE Head Lever Ass'y
⑤ Hook

Fig. 5-10-2. Entrance side Impedance Roller and FTE Head

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